

Vol 4 No 3

STORAGE

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no. 3

Biological
& Medical
Serials

The Canadian

monthly

Medical Quarterly

4³

FEBRUARY 1919



THIRTY-NINTH ANNUAL
MEETING *of* THE ONTARIO
MEDICAL ASSOCIATION
TORONTO . . MAY 1919



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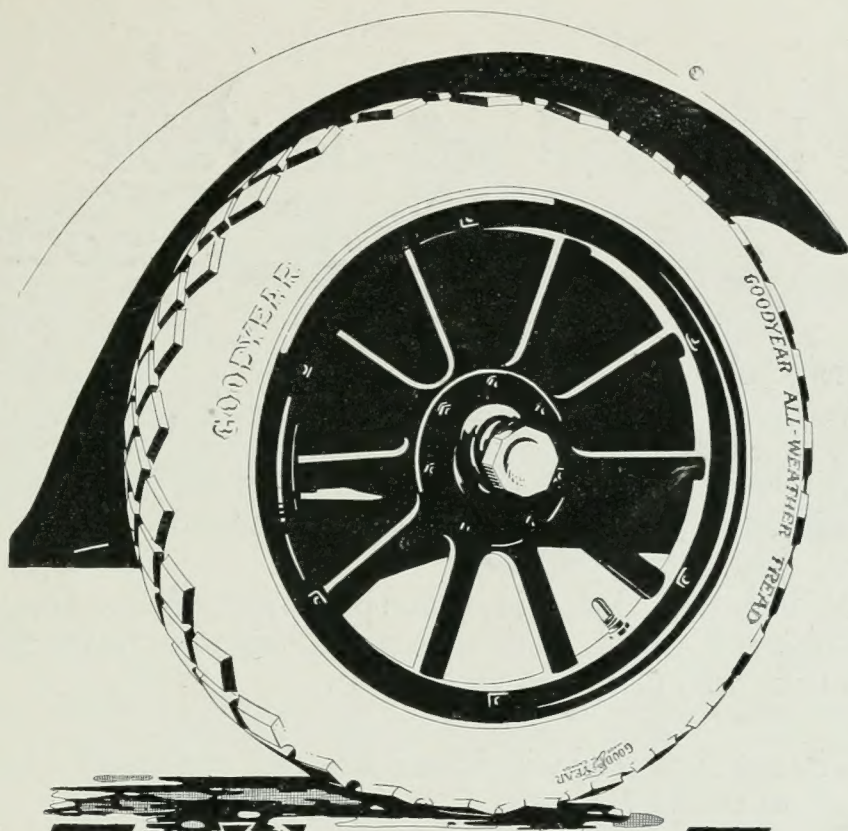
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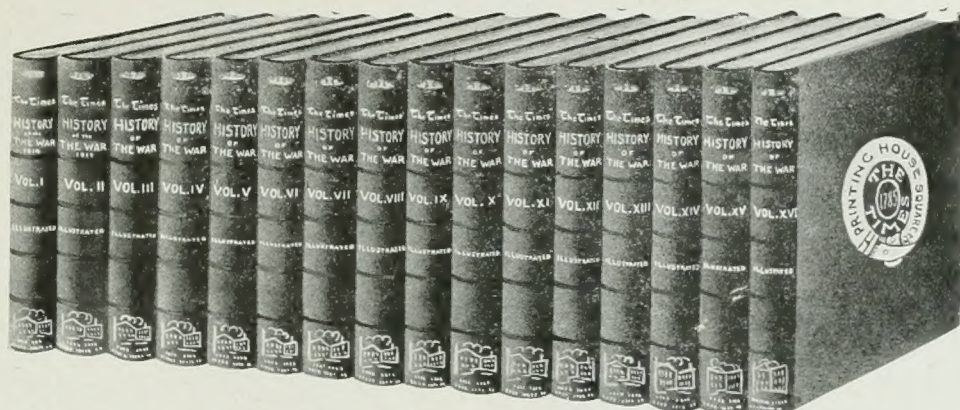
WRITE TO-DAY

The Dominion Practitioners' Exchange

401 Lumsden Building

Toronto, Canada

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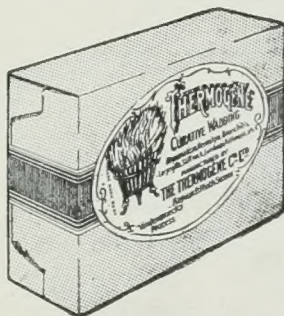
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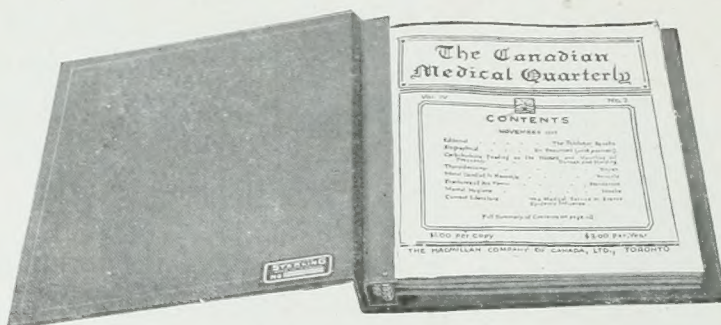
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TORONTO, ONTARIO

THE CANADIAN MEDICAL QUARTERLY

VOL. IV

FEBRUARY, 1919

NO. 3

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By

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Announcement

THIRTY - NINTH ANNUAL MEETING of THE ONTARIO MEDICAL ASSOCIATION

Toronto, May 1919



The Thirty-Ninth Annual Meeting of the Ontario Medical Association will be held in Toronto on Wednesday, Thursday and Friday, May 28th, 29th and 30th, 1919. The Committee on General Purposes will meet on Tuesday, May the 27th, at 2 p.m. The Chairman and Secretaries of the various sections are as follows :

MEDICINE

Chairman : Dr. John Sheehan
St. Catharines

Secretary : Dr. F. C. Harrison
Toronto

SURGERY

Chairman : Dr. Edmund E. King
Toronto

Secretary : Dr. T. A. Robinson
Toronto

OBSTETRICS and GYNAECOLOGY

Chairman : Dr. B. P. Watson
Toronto

Secretary : Dr. Gordon Gallie
Toronto

EYE, EAR, NOSE and THROAT

Dr. F. C. Trebilcock
Toronto

Dr. J. C. Calhoun
Toronto

Every effort is being put forth to present a programme that will be of interest to all practitioners, and we trust that the Members of the Association throughout the Province will keep the above dates in mind, and let nothing prevent them from attending the Victory Meeting of our Association.

DR. T. C. ROUTLEY, *Secretary*
TORONTO

DR. G. STEWART CAMERON, *President*
PETERBOROUGH

The Canadian Medical Quarterly

VOL. IV, No. 3

TORONTO, CANADA

FEBRUARY 1919

EDITORIAL

THE STATE vs. PATENT MEDICINES

FREDERICK PAUL, EDITOR TORONTO "SATURDAY NIGHT."

There are varying points of vantage from which the patent medicine business may be attacked. Among them that of health, that of finance and that of prohibition. Let us first consider the financial situation. For at least so long as this generation survives the backs of the Canadian people are to bend under the load of abnormal taxation. We have helped win a war but we have paid the price, both in lives and dollars. The early summer of 1914 saw our National debt at about \$336,000,000. In November last the figures were \$1,063,000,000, and at this writing our net debt stands at \$1,330,000,000, with the end of war expenditure a long way off. Add to this capital sum, upon which interest must be paid and a sinking fund provided, a yearly expenditure on pensions of \$40,000,000, with possible annual increases for many years to come, not to speak of soldiers' gratuities, which it is estimated will cost from \$75,000,000 to \$80,000,000 more, and we arrive at a point where we must realize that every possible saving by the individual should be made in order that our Government continue to function.

The State is after all only a collection of individuals, rich or poor, saving or prodigal, as the case may be, and The State's capacity to pay is limited to the individual's capacity to pay, multiplied many fold. So then, why waste money on useless things?

The exact expenditure in Canada upon what is familiarly known as patent medicines is not to be had in concrete form, by reason of the fact that most of the "best sellers" are manufactured in Canada and therefore do not appear in the Government's "blue-books." However, judging from statistics gathered in other lands, and taking into account our own almost universal patent medicine habit, one would be well within the facts to state that Canada expends \$3 per head per annum, or twenty-four million dollars per year on proprietary medicines. That seven-tenths of this money is wasted on preparations that run the gamut from the useless to the dangerous is an accepted fact. Let us take the experience of just one of these widely advertised patent medicines, Tanlac, in order to show just how extensive the trade is. In February, 1918, this company announced that within a period of three years nine million bottles of their preparation had been sold (\$1 per bottle) in United States and Canada. In the same advertisement it was also stated that the Canadian factory at Windsor had need of a capacity of 3,000 bottles per day to supply the Canadian demand. Multiplying this eight thousand by the usual number of working days per year and we arrive at the sum of \$2,496,000 per annum, reckoning the stuff at the retail price. It was also noted in this advertisement that within a space of time of a trifle over six months one Toronto retail drug house had sold twenty-two

thousand bottles of the mixture. Of course, these people may overstate the facts in regard to their production and sale as they have in their advertisements in respect to the curative value of their mixture, but there being no data available to the contrary, one is forced to accept the figures at their face value. Since the early part of 1918, quoted above, the Tanlac company has largely extended its advertising field in Canada, and as advertising sells concoctions of this sort, it is fair to presume the company's business has been increasing latterly at a rapid rate.

Now, let us hark back to the financial side of the question, which is this: Can the people of Canada afford, and can the Government of Canada afford to have the country waste yearly on inefficient if not harmful patent medicines a sum sufficient to pay over one half of our annual pensions bill?

Let us now take up the question of health from a Governmental point of view. Well known economists compute the value of the average worker on this Continent at \$4,000 per annum. This is not to say that the workers, by and large, receive \$4,000 per annum for their services. But none the less a little close figuring will prove that the turnover of the average manufacturing plant, that is the gross income of the concern, will figure out at just about \$4,000 per annum, for every hand employed. It is scarcely necessary for me to point out that the potential wealth of a country consists chiefly of its citizens. Its natural resources are nothing without them. However, the people are not an asset unless they are both healthy and industrious. Without health there can be no industry and there can be no wealth. A nation is like an army; when well, a mighty force; when ill, worse than no army at all.

Medical men will know better than I, the percentage of people who are invalided and of people who die before their allotted time by reason of the fact that there has been no proper diagnosis of their ailments. Without this and skilled treatment there is little hope of bringing these people back to health and incidentally to their full productivity. A man may well go about with a lame back for years,—tens of thousands have done so,—his earning power cut in two, because he preferred to dose himself with widely advertised kidney pills rather than have his case properly investigated and treated by a competent physician. So it is that The State suffers every time a "cure-all" is sold. The State suffers from loss of production, and it matters not whether the thing produced is the printed page, a bushel of wheat, a sewing machine or a red necktie. They all have their place in man's economic relation to the world about him.

The third and final phase so far as this article is concerned is the relation of patent medicines to prohibition. It is not my purpose here to argue for or against prohibition. If prohibition is what we want, then to begin with let us prohibit the sale of "booze" medicines. A short time since, Bulletin No. 110 was issued by the laboratory of the Department of Trade and Commerce. The purpose of this bulletin was to inform us as to what patent or proprietary medicines could be utilized, for their alcoholic effect under our so-called temperance laws.

Section 7 (b) of the Patent Medicines Act says: "No proprietary medicine shall be manufactured, imported, exposed for sale or offered for sale if it contains alcohol in excess of the amount required as a solvent or preservative, or does not contain sufficient medication to prevent its use as an alcoholic beverage." Now for an analysis of Mr. McGill's report. The chief analyst reports upon 107 different medicines, and utilizes various headings under which they are placed. For instance, "available as a beverage," Under this heading there are eleven. Under the heading "beverage use possible," ten. "Available as addition to beverage," thirteen. "Doubtful," twenty. By the term "available as addition to beverage" Mr. McGill explains that he places in this category preparations that may be utilized by a dipsomaniac. Such, for instance, as tincture of ginger which when placed in a non-intoxicating beer will satisfy the cravings of the drunkard. From the above figures it will readily be seen that there

are 34 of these "medicines" that for a certainty can be utilized as "booze," whereas if we add the doubtful ones, we have a grand total of 54; and it may be pointed out that Mr. McGill makes it plain that in these twenty cases he is not prepared to make a definite statement one way or the other. It is also interesting to note that in Mr. McGill's report he takes pains to point out that the alcoholic content is mainly utilized as a solvent for resins; but he says: "In some cases it is open to question whether the resinous matter which NECESSITATES THE USE OF ALCOHOL IS, IN FACT, A NECESSARY OR IMPORTANT COMPONENT OF THE ARTICLE."

There is the milk in the cocoanut. Disguised "booze," and bad "booze" at that. There is no reason to doubt the intent of the manufacturers of "patents" of this character. They are out to beat the Temperance Act and they are doing it, by the addition to their concoctions of such materials as Canada Balsam, Colophony, Copaiba, Myrrh, and the like. Not sufficient to make them altogether objectionable as "booze," when there is nothing better about, but just sufficient to allow some eighteen per cent. of alcohol being added.

We are called upon by the ultra-prohibition element in this country to "sacrifice ourselves in order that we may save our brother men." The man who all his life has used wine and spirits moderately is commanded to abstain in order that the drunkard and the dipsomaniac shall no longer be tempted. "The law is not for your protection," they tell us, "but for the protection of the man who has not the strength of mind, the will, to drink alcoholic liquors in moderation." We have abstained. The law of the land says that liquors can no longer legally be imported into our Provinces. Is the drunkard and the dipsomaniac protected by this law? He is not, and will not be until such time as a proper Patent Medicine Act is enacted and strictly enforced. It is futile to attempt to keep the drunkard sober so long as "booze" medicines can be purchased on every hand.

Think of the waste in dollars and cents, a short pint of medicated "booze" for a dollar bill! Think of the waste of human material caused by drinking this stuff! Think where these things lead to! The trail is plain. Patent medicines to dope. Dope to the asylum, the hospital or the jail, all charges against The State. For every dollar's worth of this stuff purchased The State pays the bill. Pays it just so surely as if Sir Thomas White passed it over a counter in his office at Ottawa.



SIR WILLIAM OSLER, BART., F.R.S., F.R.C.P.

1849—

THE LITERARY FLAVOR IN THE WRITINGS OF SIR WILLIAM OSLER*

HERMAN T. RADIN, M.D.

Only the other day, in his Presidential Address to the Classical Association in London, so great an authority as Professor Gilbert Murray referred to his successor in the Presidency of the Association, Sir William Osler, as being equally distinguished as a physician and man of letters. And a few years ago, in commenting editorially upon the bestowal of a baronetcy upon the Regius Professor of Physic of Oxford, that exemplar of the literary newspaper, the *Evening Post*, of New York, spoke of his influence as being due to the "extraordinary charm of a rare and poetic personality," adding, in its expression of regret for his having permanently left America, that "it is easy to understand that the attractions of Oxford, to a man in whom both literary taste and the historic sense are so highly developed as they are in Dr. Osler, were irresistible." All this we bring to mind simply by way of introduction to a formal discussion (for the first time, so far as we are aware) of Sir William Osler as a man of letters.

It has, of course, long been known to every careful and educated reader of even the purely technical medical writings of Dr. Osler that not the least of their charms was the grace and ease with which the author intermingled literary and historical allusions with the more prosaic subject-matter. Many of my readers may recall the amusing and ingenious examination-paper, in the *Journal of the American Medical Association*, perhaps ten years ago, submitted by a witty and observant physician, on Osler's "Practice of Medicine." Here we were asked to tell what was the advice of the Physician Rondibilis to Panurge, and what was the treatment for hiccup recommended by Eryximachus to Aristophanes. We were called upon to state who it was who said: "A bloody Moloch rules in our chairs of medicine," and to answer many other questions of like interest.

I am quoting from memory, as after this lapse of time I cannot lay my mind on the particular number containing the examination-paper, but the clever author deserved to be better remembered. He might also have asked (perhaps he did ask!) what the case of the Shunammite woman was; who the famous patient of John Locke was, and what disease the patient was suffering from; who the royal patient of John of Gaddesden was, and what treatment was prescribed; what disease was called the "Captain of the men of Death," and by whom. But why should I reveal more of the literary secrets hidden in Osler's "Practice of Medicine"? Let each reader dig them out for himself.

To be serious, however, all this indicates pretty clearly how the tedium and drab color of a purely technical work may be relieved by the possession of a charming English style, a gift of graceful, flowing expression, and the practical application of an enormous store of literary and historical knowledge. Gifts and acquirements such as these can, and do, make a text-book of medicine, or even an address on "The Treatment of Disease" (delivered before the Ontario Medical Association, Toronto, 1909), or an address on "Specialism in the General Hospital" (Johns Hopkins, 1913), as interesting as any novel or a belletristic essay.

Both from the standpoint of medicine and of English the gain from such writing is incalculable. When we think of the harsh, crabbed, slovenly, nay even faulty English that we are accustomed to in medical books and papers by even distinguished physicians—so accus-

* Reprinted from "*Medical Pickwick*," by kind permission.

tomed, in fact, that "medical English" causes our professional brethern more amusement than pain or dismay—writing such as that of Professor Osler comes like a breath of fresh air. We grant, at the same time, that not every medical writer is an Osler, just as but few among the enormous number of scientific authors can hope to be distinguished for the simplicity and clarity of Darwin and Tyndall, or the charm, grace and forcefulness of Huxley.

All that has so far been said, applies only to Sir William's technical or semi-technical writings. We may well imagine how much more elbow-room the literary graces enjoy in the various historical, biographical and occasional addresses and essays, spread out over a long period of years, and subsequently collected in volume and pamphlet form, for our delectation. For a man who has spent all of a long working life in the assiduous pursuit of medical knowledge—knowledge which has made him one of the most renowned of the world's physicians—one wonders where Dr. Osler, in the waking hours of a brief day, could possibly have found the time for such a tremendous amount of reading, or even for the mere task of writing these papers. That is, one would wonder, did one not reflect that the men busiest and most successful in their vocations always find ample time for their avocations. For the breadth and extent of Dr. Osler's reading are truly extraordinary, and would do great credit to the scholar engaged in purely literary studies, to say nothing of one as keen as our author to obey the exactions of a hard task-master like the unremitting study of medicine. Simply by way of illustration, let us take the lecture on "Science and Immortality," delivered at Harvard in 1904. This lecture, aptly called by the *Lancet* "a modern Religio Medici," covers but forty-two brief printed pages, and yet in this small space we find quotations from, or references to, the following imposing list of authors: Plato, Omar Khayyam, Tennyson, Swift, Browning, Sir Thomas Browne, Oliver Wendell Holmes, Aristotle, Shakespeare, Terence, Goethe, Homer, Jowett, Milton, Coleridge, the Bible, Shelley, Donne, Waller, Howells, Pater, Horace, Erasmus, Margaret Deland, Lucian, Matthew Arnold, Henry More the Cambridge Platonist, Montaigne, Stephen Phillips, Robert Burton, F. W. H. Myers, the "psychic researcher," Cardinal Newman, William James, Herbert Spencer, Cicero, Richard Crashaw, and the "Letters of a Chinese Official" (which anonymous work, by the way Osler like many others, really attributed to a Chinese source, the author, Mr. G. Lowes Dickinson, having not then unveiled his anonymity).

Now this is certainly a formidable list, like Homer's catalogue of ships, or the shield of Achilles, but we would not have our readers for a moment believe that the essay cited, or any other, is heavily interlarded with quotations from many and divers authors, dragged in haphazard, to make a parade of learning, in the manner of Robert Burton's "Anatomy of Melancholy" (on which famous book, incidentally, Sir William had a delightful essay in the *Yale Review* two or three years ago). No one could less resemble Burton than Osler in this respect. He quotes always without pedantry or ostentation. There is no show of learning. The quotation is as modest as the man—as quiet and as unobtrusive. It does not create the slightest annoying ripple on the smooth surface of the printed page.

Dr. Osler's own opinion of the status of medical men in literature may be well gathered from the following paragraph in his essay on Dr. Holmes: "While it is true that since Rabelais and Linacre no generation has lacked a physician to stand unabashed in the temple of Delos, a worshipper of worth and merit amid the votaries of Apollo, I can recall no name in the past three centuries eminent in literature—eminent, I mean, in the sense in which Goldsmith is eminent—which is associated in any enduring way with work done in the science and art of medicine. Many physicians—active practitioners—Sir Thomas Browne, for example, have been and are known for the richness and variety of their literary work; but as a rule those who have remained in professional life have courted the 'draggle-tailed muses' as a

gentle pastime, to interpose a little ease amid the worries of practice. Few such have risen above mediocrity; fewer still have reached it. We know the names of Garth, of Arbuthnot, and of Akenside, but we neither know them nor their works. The list is a long one, for the rites of Apollo have always had a keen attraction for the men of our ranks, but the names fill at the best a place in the literature of the country, not a place in the hearts and lives of the people. Far otherwise is it with a select group of men, Goldsmith, Crabbe and Keats, who, at the outset members of our profession, early broke away from its drudgery. In pride we claim them, though in reality no influence of their special studies is to be found in their writings. Two of these, at least, reached the pure empyrean, and, to use Shelley's words, robed in dazzling immortality, sit on thrones,

'—built beyond mortal thought,
Far in the unapparent.' "

This is not only a just and temperate appraisal of the place of the physician in literary history, but it gives us as well a taste of Osler's literary quality.

It will be noticed that in the preceding paragraph there is a reference to Sir Thomas Browne. It would be surprising indeed if there were no mention of him in this connection, for in Sir William Osler's devotion to the famous physician and author of Norwich we encounter one of the great enthusiasms of his life. One of his most charming essays (reprinted in the volume of biographical studies, "An Alabama Student, etc.") is devoted to Browne. From Sir Thomas he quotes almost constantly, and in a perusal of Dr. Osler's writings we should not experience the slightest difficulty in determining who his favorite author is. Both in the essay on Browne and in the address, "After Twenty-five Years," delivered to the students at his *alma mater* in 1899, he tells us how this life-long affection began. "To the writings of one old physician I can urge your closest attention. There have been, and happily, there are still in our ranks notable illustrations of the intimate relations between medicine and literature, but in the group of literary physicians, Sir Thomas Browne stands pre-eminent. The 'Religio Medici,' one of the great English classics, should be in the hands—in the heart, too—of every medical student. No book has had so enduring an influence on my life. I was introduced to it by my first teacher, the Rev. W. A. Johnston,* warden and-founder of the Trinity College School, and I can recall the delight with which I first read its quaint and charming pages. It was one of the strong influences which turned my thoughts towards medicine as a profession, and my most treasured copy—the second book I ever bought—has been a constant companion for thirty-one years—*comes viae vitaeque*."

It is quite in place here to quote the rest of the paragraph containing this admirable tribute, because not only does it reveal his own enthusiasm for the treasures of literature, but it embodies as well his earnest advice to medical students to cultivate early a taste for literature and art. "While medicine is to be your vocation or calling, see to it that you have also an avocation—some intellectual passion which may serve to keep you in touch with the world of art, of science, or of letters. Begin at once the cultivation of some interest other than the purely professional. * * * No matter what it is, but have an outside hobby. For the hard working medical student it is perhaps easiest to keep up an interest in literature. ** When tired of anatomy, refresh your mind with Oliver Wendell Holmes; after a worrying subject in physiology, turn to the great idealists, to Shelley or Keats for consolation; when chemistry distresses your soul, seek peace in the great pacifier, Shakespeare; and when the complications of pharmacology are unbearable, ten minutes with Montaigne will lighten the burden. *** Trite but true is the comment of Seneca—'If you are fond of books, you will escape the ennui of life, you will neither sigh for evening, disgusted with the occupations of the day—nor will you live dissatisfied with yourself or unprofitable to others.' "

And again, to quote from "The Master-Word in Medicine" (even at the risk of tiring my readers, although I hope they will agree with me that quoting from Osler is never tiresome), Dr. Osler advises his hearers—the undergraduates of Toronto University: "Start at once a bedside library, and spend the last half-hour of the day in communion with the saints of humanity. There are great lessons to be learned from Job and from David, from Isaiah and St. Paul. Taught by Shakespeare, you may take your intellectual and moral measure with singular precision. Learn to love Epictetus and Marcus Aurelius. Should you be so fortunate as to be born a Platonist, Jowett will introduce you to the great master, through whom alone we can think in certain levels, and whose perpetual modernness startles and delights. Montaigne will teach you moderation in all things, and to be 'sealed of his tribe' is a special privilege."

Here we meet some more of Sir William's favorite authors—Shakespeare, Keats, Shelley, Montaigne. Nor does this exhaust the list, as we have just seen above. The text-book, the addresses, the biographical essays are full of allusions to, or quotations from, Plato, Aristotle, the Bible and Goethe. His love for Plato cannot be better demonstrated than by the long, informing and delightful paper on "Physic and Physicians as Depicted in Plato," found in the volume "Aequanimitas." His thorough acquaintance with the Greek classics is implied in his frequently expressed preference for the Greek view of life over the Hebrew—meaning by that, no doubt, his preference for the quest of beauty and of joyousness, rather than for the attitude of sombre introspection and the search for spiritual sanctity. But Dr. Osler is old-fashioned enough to know and love his Bible, as a rare literary treasure—both the Old and New Testaments—and its wonderful passages come trippingly on his tongue. He delights as well in that modern fountain-head of noble and beautiful prose, Cardinal Newman. At the end of the volume "Aequanimitas" he compiles the "Bedside Library for Medical Students" that he has suggested in a passage quoted above, citing the following ten authors: Old and New Testament; Shakespeare; Montaigne; Plutarch's Lives; Marcus Aurelius; Epictetus; Religio Medici; Don Quixote; Emerson; Oliver Wendell Holmes. This, of course, is meant only for a beginning. As Osler himself says, "there are many others."

In the charming essay on Robert Burton (which is certainly worthy of rescue from the possible fate of oblivion in the pages of a magazine), we read that "the greatest gift that nature or grace can bestow upon man is the *acquus animus*—the even-balanced soul." Every reader of Sir William Osler's essays knows how highly he values *acquanimitas*—serenity of soul—for it is by that name, the title of the opening paper, that he calls a volume of the most fascinating addresses ever written for delighted medical hearers and readers. In these addresses, all delivered before medical or nursing schools or societies, and many of them previously published in medical periodicals, are revealed to the full not only the charm of his wonderfully engaging personality, but the remarkable treasure-house of a cultivated mind, stored to overflowing with the gleanings from the leading literatures of the world. In a style long notable for its singular limpidity, its simplicity and charm, he shares with us in all of these papers, his ripe culture, his knowledge and experience, his kindness and gentleness of spirit. In a word, he lavishes his affection not only upon "the humanities," but still more upon "humanity." To some of these addresses and papers we have already referred, but we should certainly advise our readers not to miss a single one of them. To no one well acquainted with them will it be in the least degree surprising (as the author tells us in his preface to the second edition) "that many young men on both sides of the Atlantic should have written, stating that the addresses have been helpful in forming their life ideals."

Not the least of the many debts that our profession owes to Sir William Osler is his constant insistence, both by precept and example, upon the importance of medical history and biography, and his indefatigable efforts towards the arousing of a more lively interest in these

subjects among the generality of the profession. Even amidst the inexorable claims made upon him in the last four years by that great event which is making medical history as well as every other sort of history, he has found time to turn aside to give his moral encouragement (though, alas, not to submit a contribution of his own) to that admirable and most promising venture, the "Annals of Medical History," of which the third number has but this moment appeared. In one of those inspiring bits of advice to medical students, in "The Student Life," he urges them to "try, in the waiting years, to get a clear idea of the history of medicine. Read Foster's Lectures on the History of Physiology, Baa's History of Medicine." Sir Michael Foster and even the redoubtable Dr. Baas would certainly have appreciated the tribute implied in being singled out in this fashion. In these latter days Dr. Osler would perhaps have added Puschmann's "Handbuch," although this splendid work is still untranslated; almost certainly Neuburger's new history, for the English edition of which Sir William himself wrote the introduction; and, I have no doubt, Garrison's delightful book.

In "An Alabama Student, and Other Biographical Essays," our author has collected thirteen biographical studies, all of extraordinary interest, and written, it goes without saying, with the never-failing charm of the Oslerian style. It should be hardly a surprise to find among the subjects the names of Keats, Holmes and Sir Thomas Browne. But perhaps still more absorbing are the essays on "Thomas Dover, Physician and Buccaneer (him of the famous powders); "John Locke as a Physician," in which the famous case alluded to at the beginning of the present paper is discussed in detail; "A Backwoods Physiologist," the story of the obscure army surgeon William Beaumont and the epoch-making case of Alexis St. Martin, which marked a mile-stone in the progress of physiology; Fracastorius; and "Harvey and His Discovery." And certainly we must not omit to make mention of the separately published pamphlet on Michael Servetus, heretic and physician, who disputes with Harvey and Realduo Columbo a claim to priority in the discovery of the circulation of the blood. Finally, of these biographical essays, there remains to mention the fascinating little volume on that prince of medical humanists, Thomas Linacre, of which it suffices to say that it lacks not one whit the attractive qualities of the others. It is inevitable that we should notice some gaps in the list of subjects, and the present writer, for one, would have eagerly welcomed Dr. Osler's discussion of a kindred spirit, the celebrated Edinburgh physician, essayist and letter-writer, Dr. John Brown, who would be entitled to a small share of immortality if for nothing else than those exquisite idyls, "Marjorie Fleming" and "Rab and his friends."

Of Burton's "Anatomy of Melancholy" Osler says (as does everyone else, for that matter) that it "smells of the lamp." No such reproach can be leveled against these writings of the Regius Professor, despite his ominous title. These are not simply the "elegant effusions" of a gentleman with some claims to learning and education. There is nothing either academic or superficial about them. They are solid productions, thoroughly informed, and based on all the available sources of knowledge of the subject-matter, for whether Dr. Osler writes a textbook of medicine, a technical paper or a biographical essay, it is certain that every source of information will be known to him, and that he will make each pay heavy toll. Of the occasional addresses it would be no compliment to make a similar statement. To these we are paying the highest tribute when we say that they are based simply upon his amazing fund of general and special knowledge, and his life-long study of, and acquaintance with, the problems of humanity.

Sir William Osler is, of course, a bibliophile and a "book collector," in the special sense of that word. He is an avid searcher for medical "first editions" and bibliographic rarities or similar treasures. It would be surprising indeed if he were not, for this passion is the origin of many of these studies. "Aequanimitas" contains two addresses on "Books and Men"

and "American Medical Bibliography." In his address on Sir Thomas Browne, in explaining the origin of his affection for this life-long favorite of his, he says: "I mention these circumstances in extenuation of an enthusiasm which has enabled me to make this almost complete collection of the editions of his works I show you this evening, knowing full well the compassionate feeling with which the bibliomaniac is regarded by his saner colleagues." Fortunately, bibliomania and book-collecting are widely prevalent among physicians, most of whom will regard Sir William with anything but pity for this "failing." If we may hazard a guess, their feeling would be much more akin to envy.

Of one of the most admirable essentials of literary style—a genuine and at the same time delicate sense of humor—Dr. Osler shows himself possessed in full measure. This is exhibited on almost every page, but for a taste of his quality I cannot refrain from quoting this delicious passage from "Nurse and Patient," that remarkable address combining shrewd and trained advice and good-humored banter which the nurses of Johns Hopkins Hospital were privileged to listen to in 1897: "With the fullest kind of training you cannot escape from the perils of half-knowledge, of pseudo-science, that most fatal and common of mental states. In your daily work you involuntarily catch the accents and learn the language of science, often without a clear conception of its meaning. I turned incidentally one day to a very fine example of the nurse learned, and asked, in a humble tone, what the surgeon, whom I had failed to meet, had thought of the case, and she promptly replied that 'he thought there were features suggestive of an intracanalicular myxoma'; and when I looked anxious and queried, had she happened to hear if he thought it had an epiblastic or mesoblastic origin, this daughter of Eve never flinched. 'Mesoblastic, I believe,' was her answer. She would have handed sponges—I mean gauze—with the same *sang froid* at a Waterloo." And in that interesting little autobiography "L'Envoi" he tells the story of his call to the University of Pennsylvania to succeed the lamented Dr. Pepper. After he received the invitation, "Dr. Mitchell cabled me to meet him in London, as he and his good wife were commissioned to 'look me over,' particularly with reference to personal conditions. Dr. Mitchell said there was only one way in which the breeding of a man suitable for such a position, in such a city as Philadelphia, could be tested—give him cherry pie and see how he disposed of the stones. I had read of the trick before and disposed of them genteelly in my spoon—and got the chair."

Not to tax further the patience of our indulgent readers, or to prolong unduly a paper sufficiently long, let us take leave, on this note of humor and good nature, of the distinguished physician and accomplished stylist and writer, in the hope of having aroused the interest of our readers to the extent at least of inducing those still unacquainted with Sir William Osler in his literary aspect to hasten to seek out these pages, while reminding those already introduced to renew and improve the friendship.

COTTON PROCESS ETHER AND ETHER ANALGESIA

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TORONTO

Only a few years ago, it was customary for the anaesthetists to classify an ether good or bad according to its irritative properties. These were roughly estimated by the annoyance the anaesthetists had from the production of the mucous, and very little attention was paid to the amount of anaesthetic used. If a patient did not respond as rapidly as expected to its administration, he was blamed as being an alcoholic, or to be suffering from an immunity otherwise produced. Some few men still bore in mind the excessive secretions produced by the Clover-inhaler-closed-method and therefore believed that part of the mucous was produced by closing their methods of administration to too great an extent. Still others paid attention to the concentration of the vapour administered, and obtained better results by making this concentration as uniform as possible.

A series of analyses and administrations were undertaken relative to the establishment of a clear line of thought. The irritative impurities were divided into anterior nasal and due to alcohols or acetones; or naso-pharyngeal and due to aldehydes. Smells were for the most part due to the sulphur group.

It was found that in the same methods of administration the irritation to the mucous membrane did not, as first expected, vary with the amount of aldehyde present, but rather with the aldehyde percentage in the ether-vapour, air, mixture, which ether vapour concentration was necessary for maintenance of that patient in a state of anaesthesia. In other words, the actual irritation value of a said ether of standard aldehyde percentage will vary inversely with the anaesthetic power of that ether and directly with the immunity of the patient to ether anaesthesia.

In making these statements we are of course presupposing :

1. Patients do vary.
2. As also do anaesthetic powers of different ether cans.

In proof of the first, a large amount of ether was mixed and administered to different groups of patients. Five cases of a known alcoholic type were compared with five case (of similar weight) of a type which had not indulged. They were 30 to 35 years of age. The alcoholics required from 25% to 75% more ether than did the other variety. The age and weights propositions were considered to already have been sufficiently proved, although the variation is not exact.

In discussion of the second point, variation in anaesthetic powers of cans of ether, we enter upon a field of research which is almost unlimited, and come back again to our startling suggestion of a year ago—"the possibility of absolute ether not being an anaesthetic at all."

ANAESTHESIA

Before proceeding further we had better get down to an agreement concerning the state we are going to understand as anaesthesia. In my mind, anaesthesia may be defined as analgesia (blocking of sensory impulses from the periphery) plus narcosis (or sleep). When a patient shows a type of breathing, a certain amount of muscular relaxation and contracted and central pupils, is he surgically anaesthetized? How often has each one of us seen patients carried to this stage and still suffer from severe shock, and if such is the case, such patients are certainly not anaesthetized—they are narcotized. For years we have recognized anaesthesia, at least ether anaesthesia, by a series of symptoms and have neglected this fact.

Interpreting each nervous system by the symptoms which customarily arise from it, let us consider for a moment exactly what we would obtain if we had a pure nerve poison acting upon the nervous system complex.

1st. It is a well recognized fact that a nerve poison acting on any nervous system, first stimulates, then depresses, then kills.

2nd. The more specialized a nervous system is, the more sensitive it will be, i.e., the more easily it will be stimulated, depressed and killed.

3rd. The order of specialization of the various nervous systems are :

MOST SPECIALIZED.

Special Senses.
Central Nervous System.
Sympathetic Nervous System
Autonomic Nervous System.
Spinal Cord.

LEAST SPECIALIZED.

Are not all these stages and symptoms of nerve cell poisoning simply those of anaesthesia as quoted by text books, and if so, are these typical of anaesthesia proper? I would emphatically say no. They do not in any way fulfil the requirements of our definition, for the blocking of sensory nerve impulses is not taken into consideration, and the very basis of our teaching has, at least, been incorrect. We have been safeguarding the toxicity of ether and have been neglecting the shock of the operation. Nerve cell poisoning it must be remembered, is simply an additive factor to this shock.

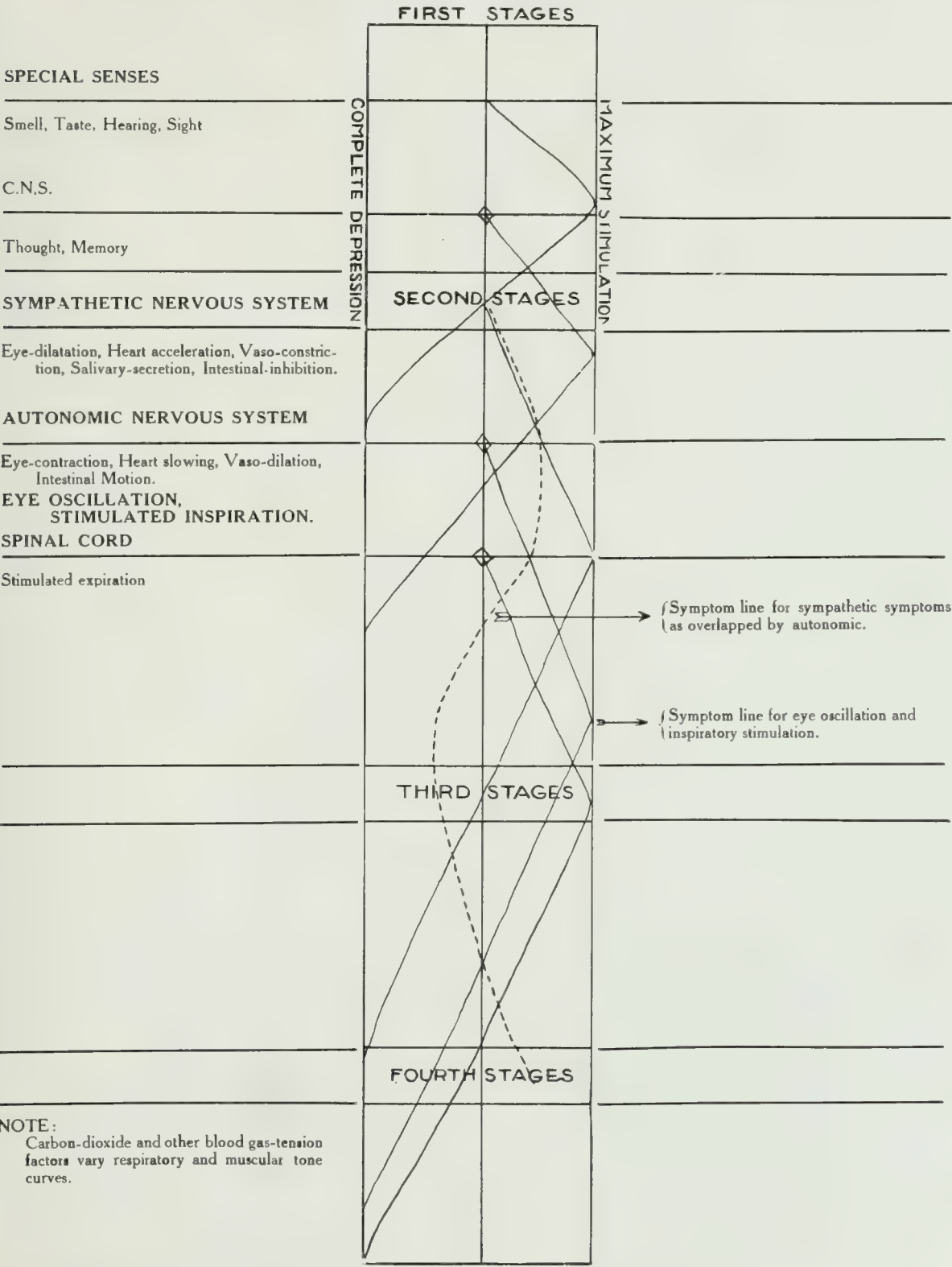
ANAESTHIC POWER AND VARIATIONS OCCURING IN SAMPLES OF ETHER

Three years ago statistics affecting 150 abdominal cases of administration of a certain commercial ether were compared with another 150 cases where another make had been given. With the one ether (after induction) 4-8 ozs. were required per hour, and with the other 6-12 ozs. This was the first real record that an ether could vary from another, although by the aldehyde research it had appeared likely. The more powerful ether contained traces of gases as well as more alcohol. Increasing of the alcoholic content was tried in 10 cases with the weaker ether. The alcohol lowered the freezing point of exhaled moisture and prevented mask frosting and therefore retained ether and ether products on the mask longer, but the anaesthetic power was not varied. It was therefore reasonable to believe that there were some other factors besides alcohol that varied the anaesthetic power of an ether.

Research was then undertaken for the obtaining of absolute ether from commercial ethers already on the market. At that time the commercial ethers were in a far more impure state than they are now, as the fusel oil groups were always detectable. After one and one-half years of hard study and work, a product was obtained sufficiently chemically pure to make it desirous to try it on patients. It demonstrated a much milder odor than what we were accustomed to and in fact would have formed the basis for any perfume. On administration, what was our surprise and chagrin to find that it was not a good anaesthetic. A noted anaesthetist, Dr. Samuel Johnston, of Toronto, reported to me that he had used 15 ozs. of it without producing proper anaesthesia. The patient, a man middle-aged, was congested to blueness but no mucous was produced. There was a severe struggling stage with muscular rigidity and sensory reflex persisted and could not be got rid of. After using all on hand, viz 15 ozs. a few drops of Squibbs ether were administered, and the patient sank into a quiet anaesthesia without sensory reflex. Very little more Squibbs was required during the whole of the operation. Exces-

DEPRESSION

STIMULATION



ANAESTHESIA :—
SYMPTOMS OF POISONING OF VARIOUS NERVOUS SYSTEMS

sive sickness was reported afterwards. Dr. Perfect, who was the surgeon, wishes also to stand as witness to this case. This same ether when perfectly fresh was used on nine other cases—all dentals. Although symptoms of nerve poisoning were present, no real anaesthesia was produced in any one, and 9-14 ozs. were given in each case before the patient was stupid enough for the extraction. Instead of sensation being reduced, the patients often become hyperaesthetic. Persistent muscular tremor and extreme peripheral congestion occurred in each. They complained on going under of feeling perfectly awful and after effects of nausea and headache usually resulted. The pulse rose very high during induction.

This same ether was given to three cats that I had on hand. Each was carried to the point when the animal stopped breathing, and then resuscitated. At no time were the muscles relaxed, and, although completely narcotized, the leg would twitch on being pricked with a pin. The recovery on resuscitation was almost immediate. After being killed three times, an apparent anaesthesia condition could be obtained, but I believe this was from exhaustion. A few months ago this experiment was repeated in detail before a number of witnesses at one of the experimental stations of the DuPont Chemical Works, but since then similar results have not been found by these chemists.

On account of the above data, it was concluded that absolute ether was not a good anaesthetic and good anaesthesia could not be obtained unless it had present in it some synergist as yet unknown.

The first co-operative thought of was (Carbon Dioxide) CO₂. If a case were given 6-8 ozs. of absolute ether and was suffering from the usual peripheral congestion, muscular tremor, etc., a small amount of CO₂ would completely relieve the condition. As described in a previous paper, the carbon-dioxide absolute ether anaesthesia constitutes a type of its own. In a demonstration given at the Academy of Medicine, Toronto, I compared the action of absolute ether to that of nitrous oxide, with which the carbon-dioxide tension factor is also a necessity. The anaesthesia produced by this carbon-dioxide-ether-method is very similar to that obtained from nitrous oxide and the recovery is almost as rapid. In practice, it was found convenient to administer the carbon-dioxide in solution with ether in a metal syphon soda arrangement with a controller similar to that used on the glass ethyl chloride tubes.

Over 20 cases of a major type, as well as a number of minors, were tried out after this method with excellent results. There was no real after-nausea in any one case. The amount of ether averaged was 5 ozs. per hour. The only objection was the excessive stimulation to respiratory effort. The color and pulse were good and no case showed mucous. The case demonstrated at the Academy of Medicine joined the doctors and had coffee within three minutes of his extraction.

While the above experiments were being performed in the operating rooms, the work still progressed in the laboratories on gas and other ether chemical analyses, as there was not considered to be enough CO₂ in most commercial ethers to act as a factor in anaesthesia. It was then discovered that this absolute ether, on being passed through a certain process, developed wonderful anaesthetic powers. The analgesic properties were such that almost major operations were performed with the patient still able to articulate clearly, without pain and not at all sleepy. More concentrated administrations simply would produce beautifully quiet sleep anaesthesia and with such, shock was impossible to obtain. After a certain length of time, however, this product would deteriorate to an unusable degree, although the analgesia power increased in more than equal proportions. A few breaths, although fairly irritating would produce almost complete reduction of sensation for some hours. Six cases were tried, including myself and friends, and we began to wonder if we were ever again going to completely recover our feelings. We were otherwise normal except for a slight sluggishness of memory.

Careful concentration and extraction of gases, etc., from this product showed there to be present certain ethylenes and their by-products. As these were not present in the absolute ether base, they must have developed in the process.

Ethylene gas was then made by text book methods and added to absolute ether. It transformed it into a moderately good anaesthetic, but the results were not to be compared with those already obtained; in fact it was by no means as good as Squibbs. However, with careful synthesizing and research, we were finally able to obtain anaesthetic synergists of an exceedingly high value.

The material, which the medical profession recognizes as COTTON PROCESS ETHER, is simply ether purified to almost an absolute stage by the methods originated, plus these synergists. As these synergists were for the most part of a gaseous nature, it was considered suitable to retain them in the ether in greater quantities than would remain at ordinary atmospheric pressure. With this end in view, the ether was kept in sealed glass ampules of about 1 oz. capacity, the idea being to administer directly from these.

PECULIARITIES OF COTTON PROCESS ETHER FOR ANAESTHESIA

Although this ether was primarily developed for analgesia only, numbers of men have used it and reported it satisfactory for anaesthesia.

Method 1. Administration from open bottle. Used in open ether bottles (whereby most of its gaseous power would escape) Dr. Samuel Johnston reported a case only a few days ago.

Patient—Female, age 28, weight 160 lbs.

Operation—Intestinal Adhesions.

Induction method—Gas ether, time 4 to 6 minutes.

Time for operation—1 hour.

Amount of ether used—8 ozs. by vol. on open mask.

Condition during operation—Absolute relaxation; no mucous—color and pulse normal.

No after effects.

This method, though apparently successful, should never be used, as ether gases of great value are allowed to escape. By it, the anaesthetic power is about what we have been accustomed to obtain from any good commercial ether, the after effects being possibly less.

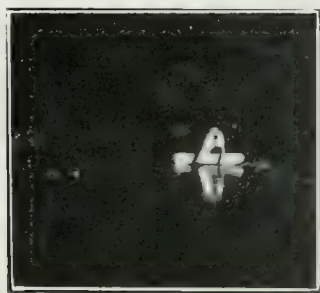


FIG. 1



FIG. 2

Method 2. Administration direct from gas ampule on open mask:

It has been found convenient to use a little device such as shown in Figs. 1 and 2. The glass top is broken off from the ampule and inserted into the rubber socket. Then proceed as with ethyl chloride, the ether gas pressure being sufficient to expel it.

CASE 1

Subject—Female, age 41, weight, 104 lbs; pulse 120.

Operation—Thyroidectomy.

Previous medication $\frac{1}{8}$ gr. morpine, 1-200th atropine, 20 minutes before operation.

Administration—Pulse immediately after induction was 110. During the operation it dropped to 100 then to 80. On recovery it registered 108. Time for induction was 3 minutes.

Time for operation was 1 hour. Patient recovered sufficiently to speak in 20 minutes.

She was, however, a little drowsy for a few hours. Amount of ether used was 5 ozs.

There was no after nausea.

Surgeons: Dr. Perfect and Dr. Harrison.

CASE 2—

Subject—Mrs. C., age 70, weight 112 lbs.

Operation—Breast amputation.

Administration—Time of induction 6 minutes. Operation, time 1 hour. Amount of ether used was 5.5 ozs. There was no after nausea and patient recovered before reaching room. Stated that she enjoyed going under.

Surgeons: Dr. Hay and Dr. Wesley.

Method 3—Oxygen semi-closed.

(a) Guathmeys Apparatus,—As you most likely know consists of three bottles connected together by a common cork tap arrangement; one bottle is used to wash the oxygen; a second contains ether, and the third contains chloroform. Either ether or chloroform can be switched on as required. The administration is controlled by the three-way tap arrangement on top. The ether saturated oxygen is conducted by means of a tube to a closely fitting face mask, to which is attached a re-breathing bag.

The value of this method was first drawn to my attention by Dr. Baldwin, of Columbus, Ohio, who was the first man to use highly charged ether in any moderated series of major cases. He drew to our attention over twenty abdominal operations which had been carried from start to finish with this apparatus. The amount of ether averaged per operation was from one to three ozs. The recovery was more rapid and there was less after nausea than would have occurred with ordinary ether. Concerning the anæsthetic power, when the tinned ether had been used by this method, they always had to use ethyl chloride to induce or they found it difficult to maintain the anaesthesia. Moreover, even with this added factor, about double the amount of ether was found necessary to bring about the same results.

(b) OTHER APPARATUS AND MODIFICATIONS. The first thought of is similar to the diagram on opposite page described below:

(c) Ether Ampule.

(d) Soft rubber bag through which oxygen feeds at the rate of about 10 litres per hour.

(e) Ether container.

(f) Tube to mask of patient.

METHOD OF OPERATING:

Mask is fitted tightly over face of patient. Ether is placed in "e" and tap "a" is opened. Tap "b" is then slowly opened. As more ether is required tap "a" is closed down. Excess re-breathing causing dysonia may be rectified by emptying "d." The whole apparatus is hung on the large oxygen tank.

This method is positively fool proof for our ether and will maintain patients uniformly at any depth of anaesthesia. With it the ether shows over double the anaesthetic value of tinned ether and the recovery is instantaneous. It has the advantage over Guathmeys'

Apparatus, in that the ether in this is evaporated and no particles are carried over, as they are bound to be when the oxygen is passed through the ether.

THE SECOND APPARATUS

An effort was made to make the principles of our first attempt and at the same time make it less clumsy to carry around. It is described under analgesia and suggestions for war administration, page 235.

1. Subject—Nurse, age, 28, weight 125 lbs.

Operation—Removal of Tonsils.

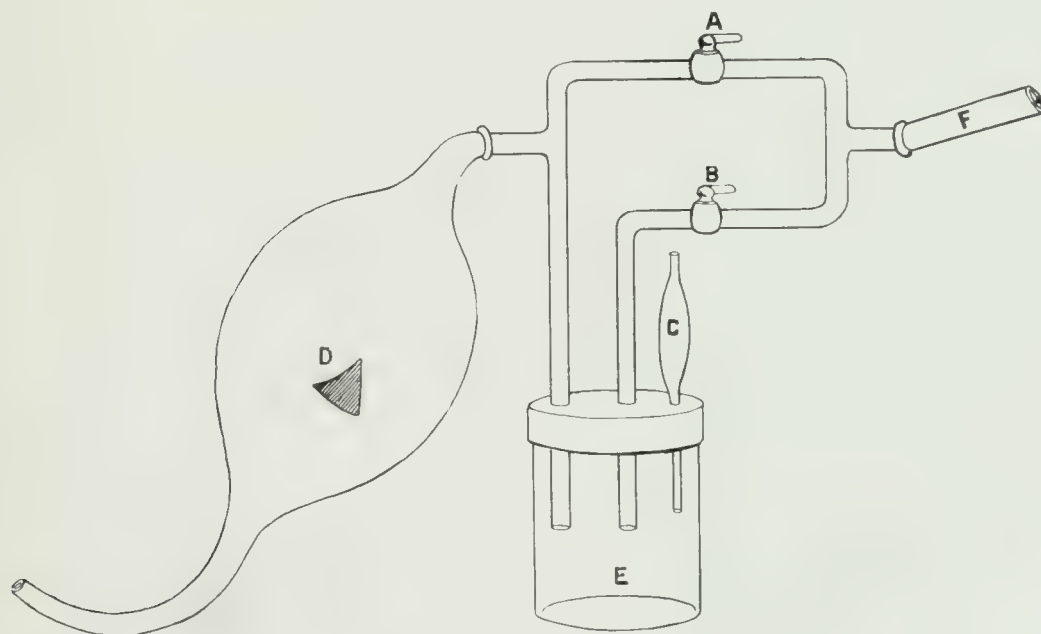
Administration—By Dr. Cotton's special apparatus. Time for induction 4 minutes.

Complete surgical anaesthesia apparently obtained. Ether was stopped and one tonsil was removed. Time for removal was 2 minutes. She was then completely awake but still without feeling. She carried on active conversation for 3 minutes when the mask was again replaced. Re-induction time was 1 minute. The same rapid recovery came about after the removal of the second tonsil. Soreness in the throat was not detectable for over one half hour, and during this period she was able to take nourishment. She considered the whole procedure a very pleasant experience. The amount of ether given was 1.5 ozs. Throat reflex was present before each tonsil was completely removed.

Surgeon : Dr. Perfect.

Witnesses : Dr. H. Harrison, Dr. Carveth.

Ether : Standard.



- 2 Subject—Mrs. B., age 35, weight 115 lbs.

Operation—Removal of 14 teeth.

Administration—By Dr. Cotton's special apparatus. Patient, sitting posture. Time for induction 4 minutes. Patient held her own mouth open. She did not complain of pain for 10 minutes. She was re-induced in two minutes. The remainder of her teeth were then removed. She was quite awake all the time and was capable of walking afterwards. Amount of ether used was 1.5 ozs.

Surgeon—Dentist.

Witnesses—Dr. Carveth, Dr. Perfect, Dr. Harrison.

Ether—Standard.

REPORT FROM MRS. B.—

“Arrived home about 1.30 a.m. feeling pretty good considering, so much so that I walked home rather than get in and out of a street car. Had a cup of tea and soaked biscuit and laid down. When taking the ether I did not have any going away sort of feelings and was not at all nauseated. I can remember coming round partly before the dentist finished, but it caused me no pain. I could have eaten hot roast pork had there been any and my mouth permitted.”

(Signed) LILLIE B.

3. Subject—Female, age 35, weight 115 lbs.

Operation—Cholecystectomy and appendectomy.

Administration—By Dr. Cotton's special apparatus. Time for induction 5 minutes.

Previous pulse, 100. Pulse during operation, 70. Relaxation during first part of operation was easily obtained. Duration of operation 1 hour and 20 minutes.

Amount of ether used was 3.5 ozs. Regurgitated 4 ozs. but did not remember it or suffer from any after nausea. She was able to talk while being returned from the operating room.

Surgeons—Drs. Perfect and Harrison.

Besides these reports a number of opinions of interest and value have been given concerning Cotton Process Ether Anaesthesia. The Carveths, of Toronto believe it to be ideal as an induction anaesthetic, for it is very rapid and out of a fair number of cases they have not yet noted any excitement stage. They like continuing it by any method whatever on anything but abdominal work. Here, they state, that the patients' muscles cannot always be completely relaxed, although there is never any muscular spasm. This opinion has been corroborated by some other anaesthetists and therefore deserves consideration.

I myself have found that by open methods, although the amount required is not large, recovery is so rapid from deep stages of sleep that careful watch and even drop rate administration is required. By oxygen semi-closed apparatus the maintenance is much more regular. But, however, if it is badly administered a certain amount of salivation results.

POST-OPERATIVE NAUSEA

Relative to the anaesthetic post-operative nausea has from a practical standpoint been recognized for years as the great disadvantage of ether administration. In a previous paper it was shown that Carbon-monoxide was produced by superheating of ether in contact with a metal and the slightest trace of this poison when present in ether will produce severe nausea. It is frequently introduced into ether by the high temperature from soldering the can. It was also mentioned “that if a certain ether was not a sufficiently powerful anaesthetic due to the absence of its synergists, a very large amount of the ether or narcotic group will have to be administered and post narcotic sickness must follow.”

With our ether, nausea after the patient was awake, has not yet occurred as far as I know, but regurgitation before waking has frequently taken place in oxygen semi-closed methods when the ether was stopped too suddenly. However, in choosing our patients for this anaesthetic, attention was always paid to the urine analyses in order to detect whether there was present any degree of acidosis. In judging the sickening effect of any anaesthetic it is also well to bear in mind the following two facts :

1. Post-operative nausea rarely occurs in old people especially when they are suffering from any degree of blood pressure.
2. A certain class of operations having to do with the intestines, especially the gall bladder, will of themselves give rise to nausea.

ANALGESIA

We now enter upon the study and review of facts for which this whole research was undertaken—the reliable production of Analgesia.

EXHIBIT "A."

COMPARISON OF INDUCTION ANALGESIA WITH ABSOLUTE AND ETHYLENE ETHERS.
Method-Oxygen Semi-closed.

Absolute ether was first administered to 12 cases and the results studied relative to blood pressure, pulse, analgesia, and after results. Two days later a similar series of administrations were undertaken on the same cases, only this time the absolute ether contained a large amount of ethylene derivatives.

With the absolute ether the blood pressure rose immediately 16 to 20 points (systolic), whereas, when ethylene was present, in half it dropped 10 points, in three it remained normal, and in the remainder it rose 10 points.

Concerning analgesia, we obtained it in six cases with absolute ether, while the other six became hypersensitive, and continued to do so until they fell asleep. The cases to which the ethylene had been administered all had their analgesia period long before becoming unconscious.

In all cases to which the absolute ether had been given, a violent headache developed within one hour of the administration. They complained of a very depressing sensation during the induction and most of them went into a struggling stage, at which point the anaesthetic was stopped. Their recovery was exceedingly slow. Those cases receiving the ethylene ethers did not complain of after symptoms. Their recovery was instantaneous and they enjoyed going under. No one of them showed the slightest inclination to restlessness on induction.



FIG. A

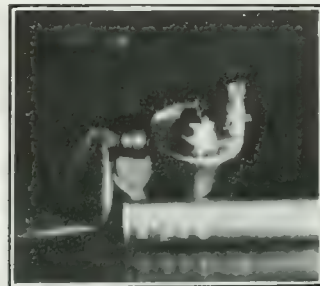


FIG. B

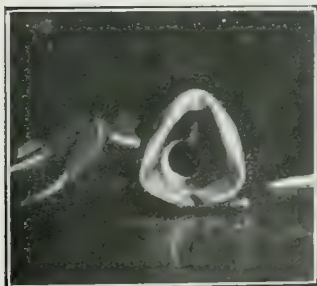


FIG. C

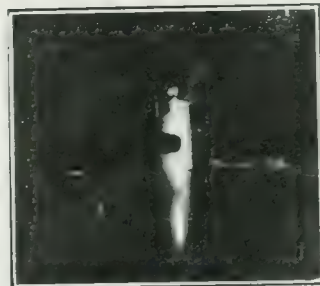


FIG. D

Figures A, B, C, D, illustrating Cotton apparatus.

EXHIBIT "B."

REBREATHING OF OXYGEN

As methods including the rebreathing of oxygen had been found useful for the administration of this ether, it was thought desirable to study them more closely. Apparatus similar to that described under Anaesthesia, page 226, was used. The ether containing bottle was filled with caustic potash sticks in order to absorb any carbon-dioxide which would accumulate. An excess of oxygen was administered i.e., 10 to 20 litres per hour, and the blood pressure was followed repeatedly in twenty cases. Eighteen of these showed a small drop in systolic and a fair rise in diastolic pressure. The other two had their rise in diastolic, but their systolic did not vary. The pulse remained normal in each case.

EXHIBIT "C."

BLOOD PRESSURE VARIATIONS

The following figures are the average of those recorded in a large number of administrations by an open mask method :

A COMMERCIAL ETHER CONTAINING VERY LITTLE ETHYLENE

Time	Systolic Pressure	Diastolic Pressure	Pulse Pressure	Pulse	
	120	80	40	80	
1	150	70	80	116	
2	160	72	88	96	
3	160	90	70	80	Beginning analgesia.
4	130	100	30	80	Not Surgical.
5	135	110	25	80	
5.5	145	118	27	80	
6	150	118	32	80	
6.5	140	90	50	80	
7	130	85	45	90	No Analgesia.
7.5	128	90	38	100.	
8	120	85	35	110.	
8.5	118	100	18	100	
9	115	105	10	90	Struggling Stage.
9.5	110	85	35	90.	

AN ETHYLENE SATURATED ETHER

Time	Systolic Pressure	Diastolic Pressure	Pulse Pressure	Pulse	
	120	75	40	80	
1	130	90	40	90	
1.5	140	100	40	100	
2	140	105	35	80	Analgesia to surgical degree.
3	140	100	40	80	
4	120	70	30	72	Sleep.
80 mins.	120	70	30	72	Anaesthetic stopped.
85 "	130	90	40	85	

From the above curves it is easily recognized that the ethylene group acts as a stapizer of the circulation. A peculiar point relative to the struggling stage is that it always seemed to occur when the pulse pressure was extremely reduced by a dropping of systolic as well as a rise in diastolic blood pressure. At this time when the patient was sufficiently conscious, she always blamed her restlessness to a peculiar numbness (not analgesia) as well as a hollow sensation in the abdomen.

At the sleep point there always occurred a drop of about an equal amount in both systolic and diastolic pressure. Whether or not this drop is responsible for sleep is a question which can only be satisfied by circumstantial evidence.

THEORY OF ANALGESIA

With the present data on hand, viz., Exhibits "A," "B" and "C" let us study the various physical chemical changes of state of solution and vapor tension of ether as it passes through the blood stream with the end in view to find out how its synergists may act in order to allow analgesia.

The boiling point of absolute ether, as we all know, is about 34.5°C. When ether is administered, it passes through the walls of the alveoli to enter into solution in the blood circulating in the lung tissues. The temperature of this blood is between 36 and 37°C., i.e., 1.5-2.5°C. above the boiling point of ether. On this account, an ether gas tension will develop thereby limiting the amount of ether which can enter the blood stream.

The point of maximum heat production (in the circulation) is in the end capillaries of the peripheral tissues where combustion takes place. The temperature here suddenly rises to over 38°C. It will therefore be easily understood that when the ether from the lung tissue reaches this point through the arteries, the gas tension will be enormously increased, both on account of lowering of pressure and the increasing of the temperature.

Ether, like alcohol, acts centrally and otherwise on the nervous system to cause a general vaso-dilatation thereby slowing the stream in the capillaries and reducing the metabolism and temperature. This is exemplified by our diastolic pressure reduction taking place on administration of absolute ether.

Volatile anaesthetic substances enter the blood stream at the lung capillaries much more slowly than does ether. If they are present in the ether administered, the vaso-dilatation caused by the ether will be replaced by vaso-constriction as soon as they gather in the peripheral circulation in sufficient concentration. That is, when we administer an ether together with these anaesthetic gases, we will have a short period of vaso-dilatation followed by vaso-constriction, and increased capillary combustion. During this vaso-dilatation, the heart will beat more rapidly due to the relief of pressure, but as soon as vaso-constriction begins to occur, the pulse slows with the increasing resistance.

I have already mentioned the fact that when ether only is present in the blood stream, there is an ether gas tension increase in the peripheral tissues which is lessened according to the resulting vaso-dilatation, by the reduction in metabolism as well as the relative approximation of blood pressure between arteries and capillaries. It can thus be seen that when the ether gas tension in the capillaries becomes very great, as it would in the above case, and these capillaries are constricted, there will be an enormous escape, and retention of ether into the surrounding tissue fluids, and the ether becomes concentrated in the lymph and tissue cells. When this concentration is sufficient the sensory nerve endings lying in the tissue fluid will become insulated, and no longer able to function. The motor nerve endings are not affected as they enter directly into the cells that they govern.

In the central nervous system, where the metabolism is not nearly so great, the ether will not localize. In other words, if the capillaries throughout the body are kept normally constricted, ether will localize in tissues according to their metabolism rate state and this localization produces localized analgesia by sensory nerve ending insulation.

Our blood pressure curves show that ethylene and carbon-dioxide, as we have already assumed, tend to equalize the circulation by lowering of systolic as well as raising of diastolic

pressure. Oxygen, as we have proved, does to a much less extent practically the same thing, and, therefore, might be classified as a synergistic gas.

It is well to remember that volatile anaesthetic substances cannot maintain constriction of capillaries unless the nerve control to these capillaries is healthy; and without this maintenance marked analgesia is impossible. Bearing upon this point is the fact that it is exceedingly difficult to obtain analgesia (without narcosis) in people suffering from anaemia, hemorrhage, syphilis or prolonged fever.

METHODS FOR OBTAINING ANALGESIA WITH GAS ETHER

These aim to utilize all the gases in the ether, as the analgesia power of an ether depends upon their presence.

(a) OPEN MASK ADMINISTRATION DIRECT FROM AMPULE.

An arrangement such as described under Method 2 in Anaesthesia was found convenient.

CASE 1

Female—Weight 180 lbs, age 42.

Operation—Breast amputation.

Time of Operation—45 minutes.

Anaesthetist—Dr. Carveth.

Patient capable of talking throughout whole of operation. She did not have any pain whatever, and in fact could not feel on what part of the body the Surgeons were working. Ether 5 ozs.

CASE 2

Male—Base Hospital, Toronto, weight 150 lbs, age 48.

Operation—Resection and Cauterization of part of abdomen for Cancer.

Time of Operation—1 hour.

Patient capable of talking throughout and quite clear mentally. He had no pain whatever. Pulse ranged from 72 to 80. He complained of being hungry before the hour was up. Pain returned within three minutes of cessation of anaesthetic. Ether used, 3 ozs.

CASE 3—

Male—Weight 180 lbs, age 18.

Operation—Adhesions and resection of tubercular mass from abdomen.

Time of Operation—1 hour and 10 minutes.

Patient remained very clear mentally and cracked jokes throughout. He was given a small meal while the surgeons were operating on him. Abdomen was completely relaxed, except at one time when he insisted upon kissing the nurse. Eyes were slightly dilated and pulse remained at 80. Amount of ether used, 3 ozs.

CASE 4

Male—Age 48, weight 132 lbs.

Operation—Opening and scraping abscess.

Time for induction 5 minutes. Senses dulled and unable to talk clearly. Length of operation 12 minutes. Amount administered 2 ozs. Held his breath for one half minute during recovery. Recovery absolutely complete within one minute. He then immediately changed tables himself. There were no after effects.

Surgeon—Dr. Harrison.

Witness—Dr. Carveth.

CASE 5 —

Male—Age 35, weight 190 lbs. (Returned Soldier).

Operation—Opening Arm.

Patient complained of feeling dull, but otherwise felt normal. Time of operation 45 minutes. Time to induction to analgesia, 6 minutes. While under he stated he did not want to simply lose pain, but that he also wished to go to sleep, as he was tired. Amount of ether used, $3\frac{1}{2}$ ozs. At two previous operations it was impossible to induce him with commercial ethers, and chloroform had to be resorted to.

CASE 6—

Male—Age 42, weight 140 lbs.

Operation—Resection of teeth from ankylosed jaw.

Time to induction—4 minutes.

Time of Operation—1 hour and 40 minutes.

Amount of ether used—6 oz.

He sat up and held head in position while teeth were resected from jaw. He did not have any sensation whatever. He answered phone twice during the operation and seemed to be in possession of all his mentality.

CASE 7—

COMPARISON OF COTTON PROCESS ETHER WITH ORDINARY C & E MIXTURE

An opportunity was lately given me to witness a comparison between ethylene ether and C. & E. The patient was aged 24, and on account of having had a recent attack of pneumonia, it was considered advisable to do her operation under local anaesthetic. She was suffering from an acute appendiceal condition.

She was given $\frac{1}{4}$ morphine and $1/200$ atropine at first as she was exceedingly nervous. At 11 p.m. she entered operating room and the skin was carefully injected with 1-10% anocain solution. Six minutes later the incision was made, but the patient was unable to stand it on account of the deep soreness of the underlying abscess. At the request of the surgeon the house surgeon started C. & E. administration. The patient became excited but sensation was not reduced. After $1\frac{1}{2}$ ozs, she dropped into a light sleep, but the abdominal muscles were extremely rigid and there was a tendency to stop breathing. Incision made through anterior aponeurosis was followed by severe muscle spasm. I then suggested that they use an Ampule of my ether on the open mask. The patient was allowed to wake up and my ether was given on an open mask without the usual surrounding towel. Within four respirations her muscles were completely relaxed and she was entirely without sensation, although able to answer questions clearly. She was not excited and would do anything which she was told. The operation continued and the abdomen was opened. Appendix had not ruptured, but whole of caecum was fixed by adhesions to abdominal wall and pelvis. 1 oz. of ether had been used by this time and they had to send to the store room for more. Meanwhile chloroform and ether were again used in order to see if it had the same effect.

The results, however, were quite unsuccessful, as sensation returned and if patient were put to sleep with it she became blue. Ethylene ether was again given. She woke up and was able to talk. Her abdomen again relaxed. Operation continued for one hour. Adhesions were broken down and appendix successfully removed. 3 ozs. in all of our ether were used. Patient at any time during operation, while ethylene ether was in use, could have walked as easily as she talked. On questioning her afterwards she remembered answering questions but did not know anything about the operation while under the ethylene ether.

One peculiar fact was noted that while under ethylene ether the pulse ranged about 80 and when the C. & E. was given it would immediately rise to 120. The patient stated that she was hungry and thirsty during the operation as she also was afterwards. There was slight dilatation of pupils but otherwise they were normal. They would roam about when covered, but fixed on any object when allowed to see.

She was as clear mentally at the finish of the operation as she had been before. Pain started within 3 minutes of cessation of anaesthetic. The anaesthetic was administered throughout by a house-man under my direction. Pulse, as I have previously noted, was remarkably slowed at point of analgesia.

OTHER CASES—

15 Obstetricals—

These patients were entirely relieved from pain but the expulsive effort was not reduced.

Six were primiparis and in four forceps had to be resorted to. One was an induced delivery of a dead foetus at eight months, while with another, operative measure had to be undertaken on account of hydrocephalus.

59 cases reported by Dr. Hudson of successful analgesia.

8 Dentals reported by Dr. Carveth.

32 Dentals Toronto General Hospital Dental Department.

6 Dentals relief of pain for drilling.

6 Breast abscesses.

40 Dressing administrations.

1 Epispadias.

2 Herniae.

4 Varicoceles.

4 Abdominals.

(b) BOTTLE INHALER METHOD.

Two varieties of this apparatus have been perfected. The apparatus constitutes in each case a small bottle capable of holding at least 4 oz. The cork of the simpler form was perforated by two tubes, one of which opened to the air and the other T'd off to nasal tubes coming from nose of patient. Ether was introduced through open tube to bottle and patient breathed in through nose and out through mouth as he required ether. Valves were later introduced to patient breathing back over ether in bottle.

In the more complicated variety the same principles were accomplished by a single perforation of bottle cork by means of sleeve tubes connected with the valve.

This method of administration was found quite unsatisfactory in a number of cases as it was difficult to teach the patients how to breathe, and they would constantly forget as their memory became undermined by the ether. It was used successfully in over a hundred dressing cases and twenty obstetricals. In the latter variety there have, however, been a number of failures reported by this method.

WAR ADMINISTRATION

Open mask administration would be out of the question, as the cases are difficult to induce and moreover every particle of ether on the battlefield should be made count. With this end in view, the inhaler bottles described under "Home Administration" were first thought suitable. Dr. Foot, a brilliant chemist who is now serving, attended to the origination of the details of these bottles. They, however, proved unsuitable as time had to be consumed in each case in order to teach the patients to breathe properly.

I then made a mask which appears to be satisfactory. With it, analgesia results after four breaths have been taken, and the patient is only depended upon to hold the mask over the face.

The photographs on page 229 are, for most part, self explanatory. Figs. A & B view the mask from the side, while C shows the face part. Fig. D represents the shutter by which the ether is turned off and on. Ether is turned off when handle on shutter points towards nasal end. The patient then will breathe directly into the bag. In order to turn the ether on, the shutter is rotated towards Intake Tap. Ether can be either poured in by unscrewing the tap or an aliquot can be introduced from ampule when it is inserted.

To use the mask for prolonged work oxygen had to be run into the bag, at the rate of 6-12 litres per hour. If the accumulation of carbon-dioxide became excessive in the bag, that is, the patient's breathing became stertorous, the bag was emptied of its gases and the patient was allowed to take a few breaths of air. For short work, oxygen is not necessary as the patient is ordered to blow a big breath of air through the mask into the bag before starting.

One case lately demonstrated at the Western Hospital had been knocked down by a motor car and the clavicle fractured. She did not want an anaesthetic on account of prejudice, but when told she could give it to herself she was more satisfied. The patient talked during the whole operation and was entirely without pain until six minutes after the anaesthetic was stopped. She then stated she wanted more of it as it made her happy. There were of course no after effects. Major Harrison of the British Army, was in charge. A second case was undertaken with this same apparatus. The patient was 70 years of age and weighed 110 lbs. Operation was to open knee joint. He required $2\frac{1}{2}$ minutes to induce to analgesia. The time of operation was over 12 minutes. About one ounce of ether was used and the patient was not at any time abnormal mentally.

For ordinary dressing cases or probing of wounds, only one to two cc's of ether are required when the mask is used. As many as twelve dressing analgesias have been induced with one ounce.

Re War Administration. One very important point on the battlefield is that of cigarette inhalation immediately previous to anaesthesia by any ether. If the subject has inhaled cigarette smoke within ten minutes of his induction, the systolic blood pressure will rise from 30 to 100 points beyond that which would normally take place, and even heart dilatation may result. He will always suffer from a headache afterwards. Cigarette inhalation following an anaesthetic always aids their recovery from it.

Many men have complained to me that in order to use this gas ether they had to learn new and complicated methods of administration, and they did not seem to recognize that this knowledge simply allows them to understand the materials they thought they were so familiar with. In fact, the statement only goes to emphasize that anaesthesia is a specialty requiring the highest possible education in both chemistry and physiology. Unfortunately, certain members of our profession, due most likely to their lack of interest in the subject, have adopted the layman's view that an anaesthetist is a mechanical technician who pours a certain dose of anaesthetic down the neck of his patient. It is quite true that a number in their pecuniary endeavor certainly may be no better, and the place of these few might with profit be replaced by a nurse, or even a trained orderly, and such could certainly not be called anaesthetists; they are at best assistants to the surgeons. If this view is persisted in it will not only endanger human life but further progress in anaesthesia will be completely blocked and a ~~ills~~ ^{ill} ignorance will reign.

A number of nurses who have witnessed analgesia work with this ether for dressing cases have been delighted, inasmuch as they considered the thing so simple that it represented the

beginning of the reign of nursing anaesthesia. For light analgesia such as required in the dressing of fresh wounds on the battlefield, they are no doubt correct, but for major operative surgery, a great deal more knowledge is required for its use than has been heretofore necessary. This whole research was persisted in for the sole reason of obtaining a dressing ether, and if it can be utilized efficiently to make things more bearable for the boys at the front, our purpose will have been completely accomplished. The theoretical and operative work mentioned in this paper were simply undertaken to this end and are given to the medical profession for what they are worth.

UNITY AND ORGANIZATION

MEDICINE HAS ACHIEVED UNDREAMED OF THINGS BY UNITY AND ORGANIZATION DURING
THE LAST FOUR YEARS

The Lancet, Nov. 16th, 1918.

What a world of truth is wrapped up in these words! What a glorious record has been established by the Medical Services! Not only have thousands of lives been saved, the sufferings of many thousands been alleviated, but unborn posterity has yet to reap the benefits accruing to them from the labours of those who have valiantly established such a proud record.

Unity sounds the key-note. It behoves all right-thinking men to meditate on this point. This same unity of purpose and masterly organization so essential in time of war, could be and should be maintained in time of peace.

The medical profession owes a duty to the universe and to itself to see to it that teamwork is evidenced throughout our land. The get-together-plan as opposed to every-man-for-himself leaves no ground for comparison.

Now is the accepted time for Medical Societies throughout the land to fill up their ranks. Unity and Organization—Think well on the deep significance of these two words.

TEN THOUSAND RECRUITS WITH DOUBTFUL HEART CONDITIONS

The British Medical Journal in a recent issue presents a very interesting report by S. Russell Wells, M.D. BSc., on the observations made by the staff of the National Hospital for Diseases of the Heart in connection with 10,000 recruits who presented doubtful heart conditions.

After discussing the various maladies associated with the etiology of subsequent heart abnormalities, Dr. Wells has presented in as concrete form as possible a table of percentages found for the 10,000 cases.

History of Rheumatic Fever....	19.2%	History of Diphtheria.....	7.2%
“ “ Chorea.....	2.6%	“ “ Pneumonia.....	5.3%
“ “ Rheumatism.....	16.1%	“ “ Influenza.....	56.0%
“ “ Growing Pains.....	26.5%	“ “ Syphilis.....	2.0%
“ “ Tonsilitis.....	22.1%	“ “ Gonorrhoea.....	5.96%
“ “ Scarlet Fever.....	21.8%	“ “ Strain.....	27.1%

Such a report is of much interest to the profession, embodying as it does a most careful compilation of statistics from a very wide field of investigation.

IMPRESSIONS OF THE WESTERN FRONT

CAPT. G. A. McLARTY, D.S.O., R.A.M.C.

It was always with great enthusiasm that one looked forward to the day that he was sent to France to see the great struggle on the Western Front. A vivid imagination cannot picture the tremendous organization necessary, the magnitude of the armies engaged, the extent of battle line and the perfect arrangement of detail in order that the maximum strength may be given to that part of the army facing the Germans and holding the line. The trip across the Channel had an element of interest as well as of danger. The vigilance of the Naval Patrol and its crews was a source of welcome protection, and the destroyers on all sides racing here and there at a tremendous speed were a comforting sight which gave confidence to all. On arrival in France one has a feeling that he is in the War Zone. Large hospitals are seen in every direction, ambulance cars and motor lorries dashing along the streets, and a picturesque mixture of khaki and blue which is seen everywhere on the streets, are all adequate reasons for this early impression.

Everyone is busily occupied at the Base. Great boats are lying along the wharves. German prisoners and Chinese Coolies in all varieties of colored uniforms, under charge of British soldiers, are engaged in unloading vast war stores. Further along the wharf are the great ordnance stores which cover acres of ground and employ thousands of men. Another interesting place is the large cobbler's shop, where old boots are remade and converted into new—as many as 35,000 boots are turned out in a week. Here and there are seen ships white in color with great red crosses painted on their sides—there can be no doubt even to the Germans of their being Hospital ships.

The stay at the Base is never long; and after many discussions with the R.T.O. (Regimental Transport Officer) transportation to some unknown point is arranged. The journey is always a slow and tedious one, miles of railway sidings are passed, with cars waiting to be moved. The trains usually move at an average rate of speed of ten miles per hour, and this along with innumerable stops, lends monotony to the trip. However the trip is not devoid of interest, as at nearly every station the R.T.O. has to be interviewed in order to find one's ultimate destination. Three days' rations are usually issued for the journey, and sometimes all-day stops are made, so that one is given the greatest opportunity for seeing the country very thoroughly.

It was a cold snowy morning when I arrived at the rail head, and after walking two miles along a muddy road, wading in mud and splashed with it from head to foot, I eventually found the A.D.M.S., a kindly old Colonel who filled me with assurance and made me feel that war is not entirely a young man's game. With so much assurance did he inspire me that when he asked me what work I would like I quickly replied "Battalion." This request pleased him and he took me to a map and showed me all the positions of main dressing stations, ambulance dressing stations and Regimental Aid Posts. All my assurance had by this time completely left me, as the Regimental Aid Posts looked to me in very close proximity to the Germans. Seeing my confidence slightly waning, he explained to me that I would stay with a Field Ambulance until I had seen something of active warfare and heard the sound of the guns.

I joined the Field Ambulance and after a splendid dinner, had a good night's sleep, only disturbed by the constant rumble of motor lorries carrying ammunition to the hungry guns ten miles further forward.

The next morning I was sent to an advanced dressing station for a few days. This dressing station was an old convent school about five miles from Ypres. There were three barn-like rooms in the building. One was used for receiving wounded, another was a temporary hospital where cases were detained for the night, and the third, a much smaller room, was used as sleeping quarters and mess. The latter was comfortably furnished with a good stove and two good beds which had been salvaged from Ypres after the first bombardment. Here and there in the yard were craters where shells had exploded a few days before my arrival, and in the distance could be heard the explosion of German shells and the occasional reply of our own guns.

All night long wounded arrived in separate convoys, one at 10 p.m., one at 1 a.m., and another at 5 a.m. These all had their mud and water soaked dressings changed and an injection of A.T.S. given. There were two medical officers stationed here, and they were busy most of the night. The day was made interesting by frequent visits by officers returning from the line and they kept us posted as to what was going on further forward.

After two interesting days here, I went to an Asylum dressing station just outside of Ypres. This whole building was riddled with shell holes and only the cellar could be used as the dressing station. Here cases were brought by ambulance from further forward. In the cellar was about six inches of water and it was only by constant pumping that we could keep the water from getting still deeper.

Behind this building the railway ran, but the track had been completely destroyed by shell fire and the ground surrounding was well ploughed with shell holes. In the yard, quite near the building, the medical officer showed me a German 17-inch shell hole which was about thirty yards long, twenty yards wide and ten feet deep. He also kindly explained to me that the shell had just arrived there a few days before, that we could be sure the gun was still in the vicinity and might fire again at any time. The ruins of Ypres could be seen a short distance away and even then, (Feb. 1916), few buildings were standing, but the large water tower and ruins of the Cloth Hall tower stood as unmistakable landmarks.

The Royal West Kent Regiment, which I joined a few days later, was back in reserve and living in huts. Here the men spent the time drilling, playing games, visiting neighboring villages and conducting working parties at night. I was given a billet in a thatched cottage near the camp, occupied by a Belgian farmer and his wife. The latter woke me early every morning bringing me a delicious hot cup of coffee and in every way made my stay as comfortable as possible.

My first morning with the Battalion found me struggling with a sick parade of 75, one-tenth of the strength of the Battalion at that time. I had fully concluded that my methods of examination were faulty as with a large number I could find no illness and accordingly marked them "duty." The result was, the next day, my parade had fallen to 46. They had been merely trying out the new Medical Officer.

We soon moved into support positions and while there lived in the cellar of an old farm house well surrounded by our own guns. This time was filled with many interesting events. One afternoon, the Belgian gunners who were still there, received their weekly issue of ammunition and proceeded to have a merry time firing rapidly for an hour, thus practically using up all their ammunition. This called for a terrific retaliation from the Germans, and for about three hours they swept every road and hedge in the countryside, knocked down several farm

houses and set others on fire; a truly interesting afternoon; but as only two slightly wounded came to the dressing station, the damage was all material, and not at all disastrous as far as the Battalion was concerned.

During the few days spent here we had a bombardment from the Germans every afternoon from two until five but it was so much on schedule that everyone found a safe place during that time, while the remainder of the time the roads were packed with lorries, wagons and men.

While staying here I had an opportunity to visit Ypres, which shares with Verdun the honor of being the most famous city on the Western Front. All the houses, cathedrals and public buildings were ruins, scarcely one stone standing upon another. If you can imagine the city of Ottawa or Hamilton completely devastated, only the cellars and small piles of rubble being left to mark the most important buildings, you have a mental picture of Ypres. The great Cloth Hall, the Hotel de Ville, the Cathedral and all the other great buildings which made Ypres famous centuries ago for its grandeur, architecture and magnificence are all gone forever, but the ruins will long remain and the history of its destruction will long outlive the history of German Kultur and its attempt to dominate the world. The solitude of the city is appalling, scarcely a sign of life anywhere. In the centre of the great square is an enormous shell hole, surrounded by many others. Occasionally one hears the dull drone and explosion of another shell as it arrives to make the destruction of ruins even more complete.

The dressing station in the front line at Hooze was made of round logs and wooden girders built into the reverse slope of a small hill so that it was not under direct observation from the Germans, although we were only about 600 yards away. Long narrow winding trenches led from here to the front line 400 yards away. Here the Battalion held the front line separated from the Germans only by 200 yards of "No man's land." The sentries were stationed at short intervals watching constantly for the approach of the enemy, snipers were in their position patiently waiting for targets which might appear over the enemy parapet. The rest of the men were either sleeping or busily at work improving the trenches. The sentries are constantly changed and every one sleeps with all clothes on, bayonets fixed in rifles, ready for instant action.

Each day the rations, water and mail, are brought up to the men and the monotony is only relieved by the frequent screaming of shells overhead, outbursts of machine gun fire and the occasional crack of a rifle. The wounded are brought to the Regimental Aid Post and after the dressing is put on they are sent to the ambulance dressing station further back and eventually to Casualty Clearing Stations and Base Hospitals, and the more severely wounded to England.

The work was not pleasant here as the weather was still wintry; the trenches were waist deep in mud and water; all evacuation of wounded was done at night; several relays of stretcher-bearers were necessary to reach the point to which the ambulances could come. As this was in February, 1916, the Germans had all the high ground, lots of ammunition, which they used freely, and the supremacy in the air, so they frequently came over our lines flying very low and bombing the villages behind our lines. Our airmen, however, were resourceful and fearless and gave a good account of themselves, although at that time at great disadvantage owing to slower machines and being fewer in number.

We were not sorry when we were relieved and went to the Messines front, after ten days behind the line at rest. This sector had always been considered quiet before. However, at this time the allotment of ammunition to our artillery was greatly increased and they became very active. The result was, that the Germans retaliated heavily and knocked down every farm house but one within a radius of three miles from the front. During one week in

support we moved our headquarters three times owing to the intensity of enemy artillery fire. One interesting feature was our headquarters while in the front line, which was a farmhouse at St. Quentin Cabaret, near Wolveringham, 700 yards from the front line, without even a sandbag for protection, where we lived in perfect comfort and safety for three months. No explanation was ever given why that farmhouse was untouched, though many suggested it might have been owned by a German.

The three months stay was livened by two German gas attacks, one German raid, three raids and one gas attack by ourselves. During June the artillery on both sides was active as our artillery was worrying the Germans on account of the approaching Somme Battle, and the Germans retaliated heavily owing to nervousness and to the fact that they were uncertain where we were going to attack. Our evacuation of the wounded was very easy, and the average time of a wounded man from the first line to a Casualty Clearing Station was one hour and this evacuation could be done even more quickly.

A Belgian farmer at this part of the front, although only 1200 yards behind the line, continued his work as usual and realizing the tremendous business possibilities, conducted a canteen there where a thriving business was done. Unfortunately the farmhouse was under observation and early one morning a concentrated bombardment commenced on the house and by nightfall all was a complete ruin. During the whole of the bombardment the farmer was an interested but sad spectator.

On one occasion, a new Officer reported to the Battalion and immediately after reaching the front line looked over the parapet to see the German line. He was promptly rewarded by getting a bullet in the neck and accompanied me back to the dressing station after spending two minutes in the front line trenches. He was greatly pleased that the wound was only superficial and that he had seen so much war in such a short time.

The possibility of German gas attacks was always an uncertain element. But in April, 1916, at Messines we were warned that the Germans had gas cylinders in their front line trenches and a gas attack was imminent. The wind blew steadily from the East for eight days, during the whole of which time we were constantly on the alert and there were frequent alarms. At 1 a.m. on the night of the eighth day the gas alarm was sounded. Immediately all the British artillery opened fire with a tremendous roar, a perfect barrage was laid down and although eight waves of German infantry followed, they were unable to gain a footing in our trenches. There was only one fatality among the officers and he had arrived in the trenches one hour before the attack. The gas used on this occasion was a mixture of Phosphine and Chlorine.

In June, 1916, when raiding was extremely popular, a combined gas attack and raid was organized on our front. It is interesting to note that of six prisoners taken, two later died of gas poisoning, which gives an idea of how effective our gas must have been. One of the letters taken from the prisoners told of the extreme shortage of food in Germany at that time although the prisoners themselves looked extremely well fed.

In July we were relieved and entrained for the Somme. We detrained at Amiens and after breakfast on the Boulevard de Spasburg, during which time the whole battalion encamped on the roadside, we started on a thirteen mile march. The country was beautiful as the grain was just ripening and the roadside was a mass of deep red poppies and a beautiful blue flower, which harmonized perfectly with the red and green.

We had ten days of strenuous training and then were moved by train to a reserve position along the Albert-Bray road. In the distance the roar of the guns could be distinctly heard and the flashes of the guns like great flashes of lightning, could be seen on the horizon, while

each night we were given an exhibition of the terrific gun fire of the Somme, as the struggles for Pozieres and Guillemont were at their height.

The evacuation of wounded in the Somme was difficult, as there was little protection for dressing stations and most of the wounded had to be dressed in the open country. Our position was in front of Trones Wood and the Germans were defending the village of Guillemont. Our dressing station, which would accomodate one stretcher, was a water tank turned on its side and dug into the side of a sunken road. The gun fire was so intense that Trones Wood, which was particularly dense, was early reduced to a few naked stumps.

The bravery and morale of the troops was beyond description. As the division we had relieved had attacked at this point four days previously we spent the first two nights getting in wounded from "No Man's Land," some of whom had been out there as long as six days. These men were all quite cheerful when brought in, and although almost too weak to speak, when their wounds were dressed and were given a tot of rum, would tell of their attempts to get back to our line. One Irishman when brought in told how on five successive nights he had 'cra led to what he thought was our line, and after going a considerable distance had always arrived back at the same shell hole. However, he was not downhearted as he told me some of the most humorous stories I have ever heard. Another wounded man told how his pal who had been with him, had been killed by a German machine gun as he was calling for help from a shell hole in No Man's Land.

One particularly pathetic incident occurred here—a wounded man was brought into the dressing station with his thigh completely shattered below the hip. He asked for a cigarette which he calmly lit and then asked for a paper and pencil and this is what he wrote, "Dear Mother, I have been mortally wounded, I am in no pain, I am dying a delightful death. Good-bye." Thus passed one of the Empire's greatest heroes.

Following our stay at Guillemont we moved up in front of Delville Wood and Longueval. On September 1st, 1916, the Germans after an extra heavy bombardment counter-attacked our position. It was a wonderful sight to see the German waves mowed down by our machine guns as they would appear over each little ridge of ground, only to be mown down at the next ridge if they passed the others. None of them ever reached our lines. The lines were securely held and the attack of September 15th, when the tanks were first used by the British, carried the villages of Guillemont, Ginghy and Fer and advanced our line about 3 miles.

Following our stay on the Somme we went back to billets for rest near Abbeville. During our stay there we were billeted in a large Chateau with a French Count, who treated us as guests and gave us his best rooms and did everything to make our sojourn as enjoyable as possible.

We then went to Vimy Ridge which at that time was very quiet. The Germans held the high ground which the Canadians took in April, 1917, but we held the heights of the Notre Dame de Lorette ridge for which 100,000 Frenchmen died. Our stay here was short and we moved a few miles further north to the front, opposite Lens, a most interesting part of the Western Front and the part well-known to Canadians—Lens. Here, warfare is entirely different from other parts because of the fact that, this being the coal-mining area, is wholly built up. In some parts No Man's Land is a street in a village. All the houses are fortified into dug-outs and machine-gun strongholds.

The Germans do this in a most thorough manner. The cellars of the houses are joined by tunnels. The ground floor of each house is filled with concrete to a depth of about 8 feet and a concrete protecting wall about 4 feet thick is put around the exterior of the house. An entrance is built in the back of the cellar and steel girders are used as supports. Some of

these dugouts were found to be beautifully finished and furnished with most artistic arm chairs and beds and all were quite safe from the heaviest of bombardments.

Further south is the scene of the famous battle of Loos. The country over which the attack was made is as flat as is possible to imagine and the country behind both the British and German lines can be seen. About 1000 yards behind the British line is a great slag heap known as "Kitchener's Pile," from which Lord Kitchener watched the Battle of Loos. Owing to the flat nature of the country in this area, the communication trenches are exceedingly long and the problem of drainage is a difficult one. However, this was solved by the British Engineers and during the winter of 1916-17 the trenches in that sector were quite dry.

The campaign of 1917 was successful for the British. It opened with the capture of Vimy Ridge by the Canadians and the advance in front of Arras. These attacks were both made in blinding snow-storms, all objectives were obtained and held and severe losses in both guns and men inflicted on the Germans.

This was followed by the Battle of Messines, in which Hill 60, Wytschaete and Messines, all forming a continuous ridge, and a tremendous German stronghold, were taken. It was here that the thirty mines, all requiring months of labor and preparation, were exploded simultaneously, blowing the whole German Garrison into eternity. Supported by tremendous artillery fire the British Infantry soon occupied those positions. This was the most complete victory the British had up to that time on the Western front, because by 5 p.m. on the 6th of June all the objectives had been taken, including three exceedingly strong positions, with a minimum loss to the British and a maximum loss to the Germans, as the whole garrison on a ten-mile front were either killed, wounded, or taken prisoner.

These successes were followed by further successes at Ypres which culminated in the capture of Paschendaele Ridge by the Canadians. Thus closed the campaign of 1917, which, while apparently not far reaching in its results, undoubtedly had much to do with the final victory.

The spring of 1918 saw many anxious moments for the Allies as the Germans pressed forward to within 30 miles of Paris. But, with meteoric suddenness, the scene changed as the Allies became the aggressors and victory after victory followed in quick succession until the Germans were forced to capitulate on that memorable day, November the 11th, 1918.

The struggle on the Western Front for Justice and Liberty has not been in vain and complete victory has now been achieved. The future generations will reap the reward of the sacrifices of those who have fought and died in this colossal struggle. To Flanders, they have bequeathed their bodies, but to their country, they have bequeathed their Honor, Glory and Patriotism, and to the world, Justice, Liberty and Truth.

TONSILLECTOMY UNDER NITROUS OXIDE AND OXYGEN ANAESTHESIA*

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If it were not for some well-established facts concerning the subject of my paper, I should feel the necessity of writing an apologetic preface to my remarks on tonsillectomy, if I deigned to present it at all; for, without doubt the tonsil question is in present-day medical and surgical literature greatly in evidence, and it is this reason, more than any other, that argues to me that, because of such variance of opinion among men of wide experience, there must be yet much to be learned and many words still spoken and written before the last word is said regarding what has become to-day, more than ever before, a vital question.

Not until there is more unanimity of treatment, especially surgical treatment, of the tonsil, can we feel that the profession has mastered the subject. We recall the appendiceal maze of twenty years ago, from which finally emerged an almost uniform technic after an army of investigators had completed their findings and had proven that which was the wisest and best procedure; so that, now, the subject of appendicitis and its surgical treatment rarely appears in our literature.

I trust that the time is approaching when we shall see a more definite, methodical technic in tonsillectomy; something that all may unite upon instead of the thousand and one tonsil operations of to-day. Tonsils are, in the main, uniform as to their structure and attachment. Throats vary only in size. There should be no more variance in the method of their removal. If a definite, precise order may successfully be followed in all cases, children and adults, if necrotic, firm, submerged or pedunculated tonsils, or the stump following a tonsillotomy, may be surely and safely removed by a routine procedure in each and every case, would it not be desired, rather than the diversified technic or absence of technic which to-day is unparalleled in all other surgical operations.

Through recent investigations, the tonsil, as a source of systemic infection, has become more prominent than heretofore. It is established beyond dispute that it affords one of the most prolific foci of infection in the whole body. The character of these infections, and the permanent damage done by them to the heart and many other structures, demands a most perfect operation to prevent the continuation of the infective process through the avenue.

Since it is my purpose in this paper to avoid an elementary discussion of the pathological conditions, connected with infected tonsils, I must apologise for digressing for a moment to call your attention to an interesting suggestion that is now being followed up by many observers, viz., that a large number of thyroid enlargements with tachycardia are being markedly benefited by tonsillectomy. Dr. Layman, of Indianapolis, who has tabulated by *questionnaire* 894 cases as results of tonsillectomy in the well known arthritic, cardiovascular, and other toxæmias, has letters from prominent surgeons, who do a great deal of thyroid surgery, showing that there is a decided uniformity of opinion regarding the relationship between tonsillar infection and the enlargement of the thyroid and hyperthyroidism. All of them advise tonsillectomy in goitre cases that give a history of tonsillar infection, but they do not depend on the procedure as a curative measure. They differ in their views as to the time of performing ton-

*Read before the Canadian Medical Congress, Hamilton, May, 1918.

sillectomy; some advocating it before and others after the thyroid operation. Dr. Crile, of Cleveland, and Dr. Halstead, of Baltimore, prefer to operate on the thyroid first, especially when the symptoms of hyperthyroidism are well marked, because tonsillectomy is a trying operation for these patients. Dr. Bloodgood, of Baltimore, writes: "The tonsil infection or coexistent infection should be taken care of before attacking the thyroid, and there should be at least two or three weeks between the tonsillectomy and the operation upon the thyroid." He also states that, in 50% of the cases of toxic goitre, he has found either infected tonsils or infected nasal cavities. At the Mayo Clinic they do the thyroidectomy to relieve the symptoms and the tonsillectomy to prevent, if possible, recurrence of hyperthyroidism in the remaining lobe.

In the early years of child life, the tonsils are subjected to a vast amount of infective material in the form of ordinary dirt as well as those of diseases having tonsillar manifestation. If the tonsil through the early months and years protects the child without itself becoming diseased, it should not be removed. But, if it becomes damaged and, therefore, not only fails to protect, but becomes a source of infection, which at any time may find its way into the blood stream, causing heart disease from which the patient may never completely recover, or rheumatism with its unhappy consequences, tuberculosis, etc., there is one proper treatment—*complete* removal of the capsule.

At the present stage of development, the only sure means of securing all tonsil tissue is to include with it the capsule—the extracapsular enucleation. The result is ideal so far as removing from the patient the source of danger to his health and life, which is, of course, the greatest consideration; while the extracapsular operation does this, and is not to be discarded for anything which fails to remove all tonsil tissue from the fossa, the writer hopes for an intracapsular tonsillectomy to be also thorough and complete leaving the capsule *in situ*. That would prove indeed to be the ideal operation, both hygienically and cosmetically, for all operators are aware that a disappointment in our tonsillectomies, as now performed, is the asymmetry of the tonsillar fossa following some weeks after the operation, this is due, in part, to cicatrization of the area of the pharyngeal muscle previously covered by the capsule, which, being denuded, must of necessity be covered by granulation tissue. Braun and others are now claiming to split the capsule and leave one or more layers attached, but the results of their claims are not yet established. The desirability of leaving the capsule is, however, to my mind, not so great, as some writers believe. There are those who attribute serious voice impairment to the loss of the capsule. In my opinion, this is not true. In a series of more than one thousand operations, since adopting the technic which includes full dissection, I have not had one case of voice impairment. In those cases in which the voice has been impaired, which have come under my observation, all show, besides the capsular cicatrix, some injury to the pillars, especially to the posterior ones, which have most to do with the soft palate. It is conceivable, however, that in singers, where even the minutest disturbance of the delicate musculature which we find in this area, a slight restriction in the formation of certain tones might follow from even the small contracture of the tonsillar fossa as it heals over the capsular area. On the other hand, all operators have observed a definite improvement in some singers' voices, amounting to an increase in their tone register from one to three notes, from the clean enucleation of a diseased tonsil with adhesions, or a tonsil stump.

The greatest immediate dangers in tonsil operations, as ordinarily performed, are anæsthetic, hæmorrhage and asphyxiation from inspired blood. A remote danger is pulmonary abscess. It is doubtful if the anæsthetic should be given first place as a danger factor. The recumbent position which has been, and is still, the position most commonly employed, subjects the patient, in a tonsil operation, to the danger of drowning or suffocation from the



THE BOSTON SITTING POSITION.



THE FORWARD SUPINE SITTING POSITION.

hæmorrhage, which, in some cases, has been due to the anæsthetic. When local anæsthesia is used, secondary hæmorrhage is not likely to occur.

We are finally convinced that the fact that the patient is sitting upright is not a problem, and that the only solution of the whole problem is the technic which includes the upright posture for both child and adult.

More than seven years ago, I witnessed for the first time, the Massachusetts General Hospital. Anæsthesia is started with nitrous oxide, and then changed to ether.

I was, of course, profoundly impressed with its advantages but with its possibilities, if still further improved. The glaring defects were, first the erect posture with chin elevated, which allowed the blood and saliva to pool in the oropharynx; and second, the necessity in most cases of interrupting the anæsthesia, and, in many instances, a second etherisation was required for the second tonsillectomy. The patient would come out of the ether during the first one.

The first of these defects I worked out to my own satisfaction, in the position which I will show you, secured by a specially designed chair, which permits of several adjustments, one of which is that the back can be leaned or inclined well forward, the chin well declined, thus suspending the patient as it were, in such position that gravity takes care of all blood and secretions, which run forward over the tongue and out of the mouth. The Boston sitting posture has only a small advantage over the recumbent posture, the surgeon can see perhaps more of his field, especially the superior portion of the fossa; but, on account of the horizontal or upward inclined oral axis, the blood pools in the fossa or oral cavity, and may be inspired into the trachea and lungs, unless the same methods used in recumbent posture, such as sponging and suction apparatus are employed. Unless the patient is profoundly anæsthetised, much blood is swallowed, to be later emitted by vomiting, at the danger of inducing a hæmorrhage. Those who witnessed the Boston sitting posture will recall that frequently the assistant or operator drops the patient's head suddenly forward to eject large quantities of blood or mucus from the mouth or throat. The second objection noted, the interruption of anæsthesia, I took up with Dr. McKesson who solved it four years ago. The answer is nitrous oxide and oxygen. The technic of its administration will be shortly given to you by Dr. McKesson.

I trust that you will pardon me for thus comparing the variance of the so-called Boston sitting posture, from the forward inclined, or recumbent sitting posture, in which neither sponging nor suction is used, the force of gravity is a more effective way caring for this troublesome and menacing complication. Among other reasons why I prefer this position are, that the structures are in normal positions and relations examined previously to operation, and it is the only position in which the blood may always be kept from entering the trachea. Many operators prefer local anæsthesia in adults, and it has many disagreeable features, both for the operator and the patient, solely because of the erect posture. These same surgeons must, however, use a general anæsthetic for their little patients.

TECHNIQUE

The patient is placed in an especially designed chair, which is adjustable for all sizes of patients, having no arms nor foot rest. The seat of the chair is brought two and a half or three feet from the floor, the back of the chair is then brought forward *beyond* the vertical meridian, and the head-rest further forward so that the oral axis is tilted downward towards the floor at an angle of 120°, or about the reading posture. The patient's body is, therefore, inclined forward, the chin down near the chest and the feet clear of the floor. The patient's position is thus maintained by a series of straps passing about the ankles, the pelvis and the

shoulders. These straps are always adjusted before beginning the anæsthesia. It is of extreme importance to retain the shoulders against the back of the chair so that the head-rest may accomplish the very important work of lining the chin. This we accomplish by a figure-of-eight strap passing under the arms, over the shoulders and crossing back of the chair, thus maintaining firm pressure. This position aids respiration by holding the shoulders back.

The operator lowers his stool to the position of the oral cavity, so that, when he looks into the mouth, his line of vision is directed well upward. Any blood will now run forward.

The Klar headlight, with the tungsten filament, is adjusted so that the light is constant and no chords interfere. The headlight is placed on the left or right to permit the anæsthetist to attend to the patient without being limited on the patient's face. The headlight is an aid in determining the depth of anæsthesia.

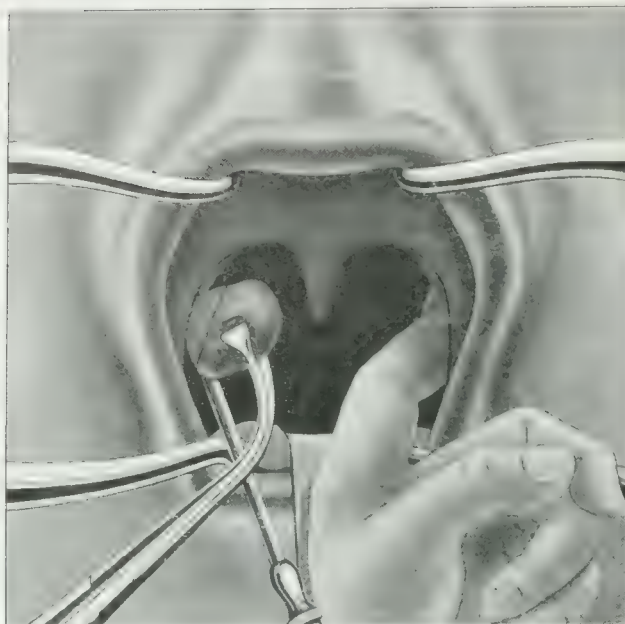
The usual sterile sheets and towels cover the patient.

The nasal inhaler is now applied with the breathing tube, leading to the gas-oxygen apparatus behind the chair, is connected to the patient's nose. After three or four inhalations, the mouth gag is inserted, and the patient is instructed to breathe through the nose. The gag is inserted before beginning the anæsthesia. The gag is made of thick gauze. If the gag is inserted too late, the patient may gag, but, by the time three or four breaths are taken, they do not feel the gag. The gag is made of thick gauze. If the gag is inserted too late, the patient may gag, but, by the time three or four breaths are taken, they do not feel the gag. The gag is made of thick gauze. If the gag is inserted too late, the patient may gag, but, by the time three or four breaths are taken, they do not feel the gag.

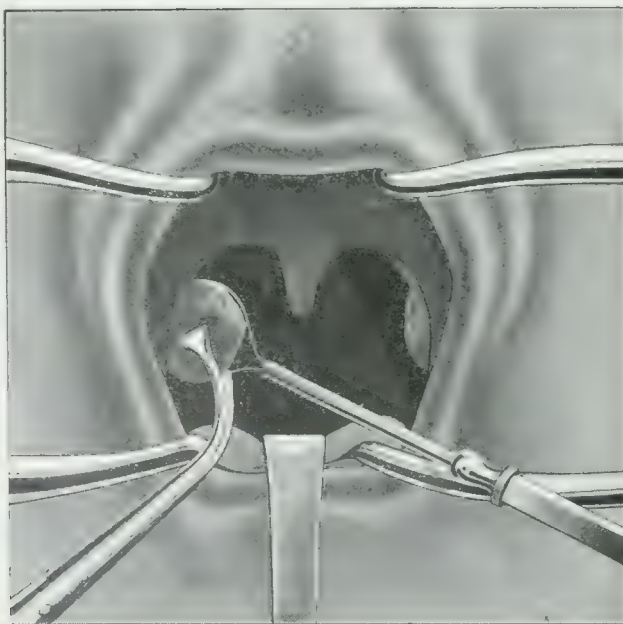
During the period of induction of the anæsthesia, the operator may co-operate with the anæsthetist. The signs and symptoms which indicate the stages of anæsthesia are: loss of reflex action, loss of reaction to the light when the head is tilted back, loss of reaction to the eye, the anæsthesia is complete. The operator, while operating, the colour of the face is more easily observed by the operator, since the anæsthetist is not attending to the patient.

The following method of attack is carried out in each case, in patients of all ages.

The tongue is depressed with the tongue depressor. The right hand and a tenaculum is applied to the right tonsil and locked. The left hand, in the right hand, the assistant exchanges the dull curved tenaculum for the sharp one. The tenaculum is broken vertically far enough to admit the tip of the right index finger. The tenaculum is taken the tenaculum in the left wrist, inserts the right index finger into, and sweeps the tonsil from the oral muscle upon which it lies. The snare of the Brown type (a wire loop) is passed over the handle of the tenaculum with the handle itself being to the median line of the tonsil fossa, the tip of the snare being tightened down on the pedicle, thus preventing the wire loop from opening. The snare is now dropped into the corner of the patient's mouth and is tightened in precisely the same way, only by the left hand. The snare is now dropped from the time the tongue depressor is removed. The dissection is finished with the left hand.



ENUCLATING BY FINGER DISSECTION THE LEFT TONSIL.



APPLYING THE SNARE TO THE RIGHT TONSIL.

the loop to the patient's left side. The assistant now presses the instruments apart in the pharynx to make room for the adenoidectomy, which is done at that stage, prior to the actual removal of the tonsils.

The assistant now takes the tenaculæ and the operator both snares, one in each hand, and simultaneously removes both tonsils. The operation is completed, the whole time required not exceeding six minutes, including the induction period of anaesthesia; the operation alone requiring from two to three minutes' time.

We invite particular attention to the mode of application of the snare as it is backwards to the usual method, but much to be preferred because the spring action of the wire *makes* it sweep through the fossa and *follow* the capsule, and the muscle may be crowded *behind* the tonsil because it is not flexible like the wire. The Holder method often leaves a portion of the tonsillar tissue to bleed or cause further trouble, because the wire loop in the posterior fossa is uncontrollable and does not follow the capsule in many cases.

Up to the instant when both tonsil pedicles are severed, practically no hæmorrhage has occurred, but, at this moment, a slight gush of blood is seen, which, by reason of the patient's position, flows outward and downward over the tongue and out of the mouth. After examining the tonsil beds, the nitrous oxide is stopped, while the oxygen is allowed to flow slowly until consciousness is regained, usually requiring from one to two minutes.

The patient is now placed in bed on his side with the face over the edge of two pillows and pointed slightly downward so that the saliva or blood is readily expectorated and not swallowed.

We should be justified in the assumption that no surgeon would attempt to perform a tonsillectomy without first familiarising himself with the minute anatomical structures in the fauces; yet, it is hard to explain the difficulties encountered by those operators who fail to separate the underlying capsule from the pharyngeal wall in any other manner than that the line of cleavage is not recognised. When once the edge of the capsule is lifted, the remainder of the dissection is easy, but, if the separation is attempted inside the capsule, in the tonsillar tissue, nothing is easy, and ones' troubles multiply, probably ending in an incomplete removal of the tonsil tissue, accompanied too often by serious injury to the surrounding muscles, when sharp instruments are used. The surrounding muscles bleed profusely and often dangerously. The field is partially obscure in spite of suction and the vigorous use of gauze sponges, which greatly irritate the delicate membranes and add much to the patient's discomfort during convalescence.

The operator, in his earnestness to secure all tonsil tissue, frantically snips at prominences, which may later prove to have been folds of some palatal muscles. This may appear too darkly painted, but the end results in thousands of patients presenting muscular destruction, cicatrices, distortions of the soft palate, usually associated with remnants of tonsillar tissue, verify the truth of this picture.

I do not say that it is impossible to do a good, clean, safe tonsillectomy in the recumbent posture under ether, with sharp instruments, but I do affirm that, in so doing, one is always working under difficulties and amid dangers to the patient which are unnecessary.

I mention the line of cleavage to start the capsular dissection. The importance of this was impressed upon me some years ago, when a laryngologist of international fame, whose name is familiar to all of you, himself a designer of one of the popular instruments in tonsil operations of to-day, did me the honour of witnessing my operations. He said, "Doctor, how is it you get under the capsule so easily, I don't understand." I will try to give you the answer as I gave it to him. But his question set me thinking, and I wonder if, after all, this might not be the crux of the whole matter,—the reason for the proposal of the guillotine and evulsing procedures which aim to pluck out the tonsils, as if it were foreign body, without the attempt to do a surgical dissection.

The palato-glossus muscle, commonly known as the anterior pillar, is a very thin structure antero-posteriorly. The line of cleavage lies between this and the tonsil. The anterior edge of the aponeurosis, known as the tonsillar capsule, turns around the base of the fossa tonsillorus, and is lightly attached to the pillar in some cases, and in other cases to the superior constrictor pharyngeal muscle only. In order to get started under the capsule, therefore, one must keep well forward against the pillar. There can be no debate that this separation can best be accomplished by a blunt pointed instrument. The requirements are similar to the introduction of the urethral sound. In order to follow the urethra, and not injure the walls or make a false passage, should a sound be blunt or sharp pointed?

With this initial separation made, the finger enters the fossa beneath the capsule, and one cannot make a false passage. The only thing one can possibly do is to remain under the capsule until the tonsil is free, except the pedical. The finger here has the same elements of safety as the blunt urethral sound. But, instead of unfeeling steel, the delicate sense of touch determines when dissection is complete. All surgery has long given preference to the finger dissection. In delicate separations, goitres, abdominal adhesions, pus-tubes, and so forth, are invariably handled, by the careful surgeon, as much by the fingers as possible.

This *modified* finger dissection, however, is productive of still less trauma and consequent soreness than where the finger is used alone, since the trauma to the anterior pillar resulting from the excessive pressure required to rupture the mucus membrane connecting the tonsil and the anterior pillar is avoided by the use of the blunt, curved dissector as described, preliminary to the introduction of the finger tip.

Hæmorrhage, after leaving the operating table has occurred but five times in over one thousand operations, in which this technic has been used exclusively. In each case it was anticipated, because of systemic conditions. This extremely low record of hæmorrhage is attributed to the anæsthetic, with its consequent absence of nausea and vomiting; to the erect posture, and to the total absence of all edged or pointed instruments in the operations. The vessels which enter the tonsils are crushed by the snare and hæmostasis thus induced. The vessel of the pillars and pharyngeal muscles upon which the tonsils rest are injured and it is these vessels which bleed when severed by cutting instruments. For the same reason, our patients eat with little discomfort within twenty-four hours, because the pharyngeal muscles which begin the action of swallowing, are uninjured. In this technic, the perimysium is scarcely broken, since, in the finger dissection, the *ball* of the fingertip is kept against the throat wall and the nail against the tonsil. Convalescence is further shortened by the eliminating of the gauze sponge and its trauma, so that the average patient is entirely well on the fourth or sixth day and, at no time, particularly uncomfortable.

Our technic comprising the following features, is original:

1. Forward inclined sitting posture with chin near chest.
2. Continuous nitrous oxid-oxygen anæsthesia *without ether*.
3. Backward application of the snares.
4. Application of a snare to each tonsil, when both are removed simultaneously.
5. Removing adenoids before the tonsils.

CONCLUSIONS

1. This technic is uninfluenced by the size of the tonsil and is equally adapted to the free, the submerged or adhering types.
2. It is applicable to patients of all ages.
3. There is a marked reduction in both the operative and post-operative hæmorrhage.
4. The forward inclined sitting posture is natural, convenient, and the safest position for this operation.

5. In this position blood takes care of itself by gravity, aided by the flow of gases out of the mouth, in a more effectual manner than it is possible by sponging suction apparatus, or any other position in which the operation may be thoroughly done. The danger of asphyxia by inspired blood or froth is absolutely eliminated.

6. The inspiration of infective materials squeezed from the tonsil, causing pulmonary abscess and gangrene, is in this manner also avoided.

7. Nitrous oxid-oxygen is an ideal anæsthetic for this work in this position; the use of ether is never necessary and has not been employed in a case in our last six years' series.

8. The minimised trauma, agreeable anæsthetic, followed by no post-operative complications, short and fairly comfortable convalescence, produces a more desirable impression upon the patient.

THE MEDICAL PROFESSION AFTER THE WAR

It is too soon—the world, victorious and vanquished, too unsettled—to say what is coming and what is to be done. It is an hour in which nations are being made, unmade and remade. We hear, we talk, we read of reconstruction. The reconstruction problems are, in the main, twofold; one, the salvaging of mutilated humanity; the other, the reconstruction of devastated cities, towns and villages. The former, the salvaging of the heroic remnants of war-worn men, is the more important. Our reconstruction problem as applied to the physical reconstruction of the disabled soldiers is certain not to be the gigantic task that it would have been had the war continued for a long period of time. There will, of course, be much to do in this regard; but this work is in competent hands and well provided for. Our reconstruction problem as it applies to the returning of more than 30,000 military physicians to civilian life is again not a problem of magnitude. The physician before he went to war was, in most instances, a man of home and family, and in most instances home, family, his professional confreres and the community wait to welcome him with honors.

However, our reconstruction problem as it concerns the relation of the physician to the great social problems that are to arise "after the war," is a problem of magnitude. One's senses are startled by phrases in the modern writings on social and economic subjects. One hears of "equalization of risk and return," of "conscription of wealth," of "health insurance," of "national ownership," of "state medicine," of a "league of nations," "international medical alliances," and similar conceptions. With these, and as a part of these, will be new problems of the relation of physicians to each other and to the public. Physicians will have as much influence as any other class in the weaving of the new social fabric. It is well to realize this and to appreciate the need of closer knitting together of the profession itself—of stronger organization—so that we may face these problems with the strength of many minds united. Thus the medical profession may be able, not only to secure the rights and recognition it merits, but also to have that real influence necessary for the best interests of the public health in the new order of things. The medical profession has served, it serves and it will continue to serve when called on, but in its altruism must not forget that the profession will have to guard its own rights and prerogatives if they are to be guarded at all.—*American Medical Association Journal*.

McCRIMMON'S LIQUID**A POWERFUL GERMICIDE AND ANTISEPTIC**

HOLFORD WALKER, M.D., TORONTO.

My attention was drawn to this preparation through visiting a dog show last autumn where two or three hundred dogs were on exhibition. In contrast to similar exhibitions I was struck, upon entering the building, to find the atmosphere quite sweet. Upon investigation, I found upon a table some bottles containing a perfectly clear liquid, which upon enquiry from the person in charge, were pointed out as the reason for the odorless condition of the building. The liquid was devoid of smell, and, being informed that it would not injure the mouth, I found it mildly astringent, with very little taste.

Mr. McCrimmon, the Chemist in charge, informed me that he had been investigating the subject of disinfectants for a number of years and thought that at last he had perfected one far in advance of any other, the product which was apparently responsible for the pleasing atmosphere already noted. After further enquiry concerning its merits and methods of use I asked to have a sample sent to the Victoria Memorial Hospital where I attend, also one to my residence, in order that I might personally carry out some investigations.

After a few tests in especially indicated conditions, I came to the conclusion that there was a latent power far more potent in this solution than either Mr. McCrimmon or I were aware of. Further investigations demonstrated the fact that I was dealing with a powerful germicide when brought in contact with germ life in association with living tissue. Laboratory tests, beyond any shadow of doubt, verified my conclusions. In the surgical field one great advantage is its simplicity of application. There is little or no carefully detailed technique required. It is simply a matter of application of the required strength.

In referring to cases that have passed under my observation I will state my experience as to the strength of the liquid used, with results, so that there need be little difficulty in deciding what strength is advisable, under the circumstances, after a short experience.

I may state that I have been made aware of all the ingredients used in its manufacture. It has been employed as a commercial deodorant for some months and Mr. McCrimmon informs me that he is quite willing to impart the same information to any physician so desiring. The liquid for medical purposes is made of chemically pure drugs.

Personally, I am only too glad to have such a potent remedy at hand to aid me when occasion requires; and herein desire to draw the attention of the profession to it in order to widen the field to test its merits.

I have selected the following conditions in which the liquid has proved beneficial, indicating its partial field of usefulness.

In abscesses of all kinds I feel assured that McCrimmon's Liquid will prove to be the sheet anchor of the future. I have had three occasions to use it on large abscesses, two of which were most fetid. The technique was as follows: on opening the abscess and expressing out as much pus as possible, the cavity was injected with as much fluid as it would hold of the full strength solution, while the tissues surrounding the abscess were firmly held in position by an assistant (smart irritation follows this first injection for but a brief period). At the end of two minutes the liquid was allowed to escape and the cavity again injected with a 50

per cent. solution to thoroughly wash away any remaining pus. Upon completion of the second injection no fetid odor was observable. (Should there be any odor remaining spraying the room with a little of the commercial solution perfectly clears the atmosphere.) Should any pus be found, the procedure is repeated as outlined. In my experience no further discharge of pus occurred and the cavity promptly began to contract.

INCISED AND CONTUSED WOUNDS. Apply the full strength thoroughly to the parts and apply 25 or 50 per cent. solution to moisten the gauze and leave it in situ. Do not disturb it again unless required. It will heal promptly under the first dressing.

ACNE CILIORES AND GENERALIS. Rub the parts thoroughly night and morning with friction as long as necessary.

PYORRHEA ALVEOLARIS. Rinse the mouth thoroughly with a teaspoonful of the full strength for a minute or two night and morning for a week.

BROMIDROSIS. Rub the armpits and feet, night and morning, with full strength solution for a week, and repeat if required.

TONSILITIS. Spray fauces with fine vapour every three or four hours during first twelve hours with full strength. (Expectorate it.)

LACRIMATION. Apply a few drops of $\frac{1}{8}$ solution night and morning. Dilute to $\frac{1}{16}$ if too irritating.

ECZEMA. Mrs. H. suffering from a severe attack of the scalp and neck was promptly cured in four days by the application of the full strength rubbed to the parts with friction night and morning.

NASAL CATARRH. Spray both nostrils night and morning with full strength solution. It smart at first, but soon ceases, leaving a feeling of comfort.

One is led to believe that McCrimmon's Liquid proves curative for external hemorrhoids by applying full strength to the surface after each motion of the bowels, for one week; it affords the greatest relief in internal hemorrhoids by similar application, and to all intents and purposes, cures them.

BOILS AND CARBUNCLES are aborted by the injection of a minim or two in the early stages, or by applying a wet compress of full strength covered with oil silk and changing every twelve hours. It has proved an absolute specific in the treatment of poisoning from poison ivy. The irritation almost immediately ceases and all symptoms disappear in twenty hours.

A very interesting case of staphylococcus infection of the feet, through ruptured blisters, occurred recently in the case of Mr. W. N. and afforded an illustration of the relief secured by McCrimmon's liquid after two or three months treatment in Canada and New York. At first, applications were made daily for three days of one hour's duration with the full strength solution, followed by moist dressings, of twenty-five to fifty per cent. during the intervals. In one week the condition was to all intents and purposes cured, there being no evidence of infection, merely a healthy granulating surface that would heal in due course. The healing process was more or less retarded by the indiscretion of undue exercise from time to time, but has since completely healed.

It proved the most potent remedy I used in the early stages of last Autumn's epidemic of Influenza, beginning by spraying the fauces and nostrils, first clearing the latter of all mucous and repeating same in four or five hours if required. I have only had a few cases under observation; two of them were very severe attacks, and the prompt relief afforded in both local and general symptoms was so marked that I foresee a very valuable aid in combatting the disease.

Varicose ulcers respond most promptly to its use, full strength at first, half hour daily for three days; later fifty per cent. for an hour daily with moistened absorbent cotton.

In superficially comparing the pros and cons of Dakin's Fluid and McCrimmon's, in the medical aspect, as far as my experience affords, there is no comparison, inasmuch as the former does not appear to have entered that field, whereas McCrimmon's Liquid has proved invaluable in so many conditions in general practice. To my mind it is hard to distinguish at this early date which will claim it as their greatest aid, the surgeon, or the medical practitioner.

I trust the above will afford sufficient outline to indicate further investigation by the profession.

Dr. H. Walker, Athelma Apartments, Toronto, will gladly receive enquiries.

• REQUESTS FOR PHOTOGRAPHS

We take great pleasure in announcing that, in response to a great many enquiries for photographs of the eminent physicians, appearing biographically in the different issues of the Canadian Medical Quarterly, we are now able to supply them to any of our subscribers upon request.

These photographs are 7 x 5½ inches in size, and very suitable for framing. In time they will form a very fine collection, quite worth while for any doctor to own. The series so far comprises the following : Dr. Christopher Widmer, 1780-1858 ; Dr. William Rawlings, Beaumont, 1803-1875 ; Sir William Osler.

Each issue of the Quarterly will contain a portrait and biographical sketch of an eminent Canadian physician, and enquiries for portraits of these men should be addressed to The Canadian Medical Quarterly, 70 Bond St., Toronto.

CHRONIC ENDOMETRITIS*

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Introduction.—When the term "Endometritis" was introduced into Gynaecological literature ideas of pathology were not so clearly defined as they are now. It came to be a convenient term, used to designate a supposed inflammatory condition of stroma and glands, giving rise to a great number and variety of symptoms which were associated with more or less enlargement of the uterus. The symptom-group comprised menorrhagia and dysmenorrhoea, leucorrhoea, sterility, tendency to abortion, pain in the back, and general debility. The presence of all or of any combination of those symptoms, without other physical sign than slight enlargement of the uterus, was held as sufficient evidence on which to base a diagnosis of endometritis. Hence arose a symptomatic classification into haemorrhagic, catarrhal and dysmenorrhoeic varieties. Later anatomical and microscopical research revealed different appearances in the endometrium in cases presenting the same clinical picture, and there arose an anatomical classification into interstitial and glandular endometritis (Ruge and Veit) according to the tissue in the endometrium supposed to be affected. More critical examination of the microscopic appearances presented showed that many of them were not of an inflammatory nature, and that, whilst some were pathological others were simply physiological variations dependent upon normal menstrual function, or upon the normal retrogressive changes which the uterus undergoes in later sexual life. The result of this work has been to restrict greatly the term "Endometritis" and to ascribe to other causes many of the symptoms hitherto supposed to be due to it, and to find some other explanation for the pathological appearances presented under the microscope. The position I take on this subject is in agreement with that of Hitschmann and Adler¹ and others, who hold that the only true endometritis is that of the interstitial type; that so-called glandular endometritis does not exist, but that most of the appearances hitherto described as such, are merely physiological changes in the glands occurring in the course of the normal menstrual cycle, and that when glandular hyperplasia is definitely present it is more of the nature of a new growth than of an inflammation.

For convenience of description, glandular hyperplasia is dealt with in the present chapter but it will be made clear that it is not of inflammatory origin, and that it cannot in itself be held responsible for many of the symptoms hitherto ascribed to it. The whole subject is still a matter of controversy, and agreement will not be reached until we understand more about the physiological conditions influencing the uterine mucous membrane. In the following pages an attempt is made to treat the subject in the light of that knowledge which we now possess. This involves the shattering of what has hitherto been regarded as a definite clinical picture, but it undoubtedly tends to a more careful analysis of symptoms in relation to physical signs and pathological findings, and will ultimately lead to more rational and therefore more effective methods of treatment.

CHRONIC INTERSTITIAL ENDOMETRITIS

According to strict pathological standards this is the only form of chronic inflammation in the endometrium. As the term implies, the lesion is limited to the interstitial tissue or stroma. In its etiology, symptomatology, and pathological anatomy it does not differ essentially from inflammation in other tissues.

*The New Gynaecology—Eden and Lockyer—Vol. II.

1. "Die Lehre von der Endometritis." Wiener med. Wochenschr., 1907, lvii. 1297; Berlin klin. Wochenschr., 1908, xlv. 715; Berlin klin. Wochenschr., 1909, No. 41, p. 1869; Arch. für Gyn., 1913, Band c. 233.

Etiology. It may follow an acute inflammatory condition of the uterus, (a) due to any of the ordinary infective organisms. The consensus of opinion among writers on the subject is that the gonococcus is most often responsible, and after it the streptococcus. The latter is usually implanted in the uterus post partum or post abortum. More rarely some form of staphylococcus, or one or other of the saprophytic organisms is the infective agent. In many instances no history of a preceding acute infective lesion can be obtained, more especially in gonorrhoeal cases. In such the inflammation has been subacute or chronic from the beginning. It has long been known that the gonococcus may remain for a long time in the genital tract in a state of attenuated virulence, and more recently, the same thing has been demonstrated in the case of the various streptococci.

Pathological Anatomy. The lesion may be confined entirely to the mucous membrane of the uterus, but more frequently it is associated with cervical inflammation and there may be extension to the uterine wall and uterine adnexa. The uterine mucous membrane is swollen, sometimes to the thickness of 4 or 5 mm., and the surface is covered with amucro-purulent discharge. On microscopic examination there may, or may not be marked oedema and exudation into the stroma. Oedema is not of much significance, as it varies according to the time of the menstrual cycle at which the scrapings are obtained. Oedema, formerly thought to be of inflammatory origin, is in many instances that normally present in the mucous membrane before menstruation. The only definite evidence of chronic inflammation is the presence of accumulations of round cells and the occurrence of plasma-cells. In well marked cases of endometritis there is diffuse or patchy infiltration by round cells in the interglandular tissue, and there may be accumulations of them around and in the lumina of the glands.² In the subacute stage polymorphonuclear leucocytes may also be present, especially in gonorrhoeal cases. The significance of the presence of plasma-cells is disputed. Hitschmann and Adler attached considerable importance to them in making a diagnosis of endometritis, but have somewhat modified their earlier statements in their latest communication.³ Henkel,⁴ Theilhaber and Meier, Fothergill⁵ and Schickele and Keller⁶ believe that their significance has been much overestimated. The last mentioned authors hold that in some cases, in which the histological picture and the history indicate inflammation, plasma-cells are absent, whilst in many cases of displacement of the uterus, without signs of inflammation they may be present. Büttner⁷ and Schwab⁸ point out that they often disappear soon after the development of the inflammatory process. Büttner demonstrated their presence in 58 out of 189 cases of curettage and found that they tend to increase with age, attaining their maximum in the second half of of sexual maturity and then diminishing towards the menopause. While, therefore, round-cell accumulation, together with the presence of plasma-cells, is an almost certain criterion of inflammation, the absence of the latter should not exclude this diagnosis. It must be remembered that, normally, small lymph nodules are present in the endometrium. I have seen several specimens containing them, and in none was there evidence of inflammation.

In addition to stroma changes there are usually present vascular dilatation and the formation of new vessels, often in groups.

As sequelae of these changes we should expect, judging from analogy in other tissues, a progressive fibrosis and thickening of vessel-walls^b, and this undoubtedly occurs. A number of cases hitherto described as fibrosis of chronic inflammatory origin are, however, merely instances of physiological atrophy. In some cases cure may occur without any permanent histological change in the tissue.

The possible effect of chronic inflammatory lesions of the stroma on the uterine glands has been a subject of great controversy in the past and cannot yet be said to be definitely

2. Theilhaber and Meier, Berlin, klin. Wochenschr., 1907, vol. xlix, 1196; Arch für Gyn., 1908, Band lxxxvi, 628.

3. Arch. f. Gyn., 1913, Bd. c.

4. Berlin, klin. Wochenschr., 1909, Bd. xlii, 1137.

5. Brit. Med. Journ., 1911, Vol. I, 559.

6. Arch. für Gyn., 1911-12, Bd. xcvi, 586.

7. Arch. für Gyn., 1910, xcii, 781.

settled. Most of the recent investigators however, agree that glandular changes of any marked degree seldom result, and with this opinion I am in accord. It will be pointed out when we come to deal with so-called glandular hyperplasia that there is usually no evidence of an inflammatory origin. Further, in definite cases of interstitial inflammation, hyperplasia of the glandular elements is not more common than in cases with no demonstrable inflammatory reaction. From analogy in other organs, such as the liver, the Fallopian tube, and even the cervix, epithelial proliferation, as the result of a chronic inflammatory process would be expected. Its absence in the uterine mucosa emphasises the fact that it is a tissue apart, and that, in interpreting appearances in it we must be careful not to generalize too much from conditions found in other organs.

In gonorrhoeal endometritis, the most common form, glandular hyperplasia is not at all common. If we take the presence of plasma-cells as a criterion of inflammation, Büttner points out that in only 22.4 per cent. of scrapings, in which they are present, is glandular hypertrophy demonstrable, whilst in cases in which plasma-cells are absent, hypertrophy is present in 17.6 per cent. The difference is so small that the conclusion must be that inflammation is not a cause of glandular hypertrophy or hyperplasia. In definite inflammatory lesions of the uterus and tubes, such as pyosalpinx, where an opportunity is given to examine the mucosa after removal of the organs, glandular hypertrophy in the endometrium is not more frequently met with than in the apparently normal organ. These facts would seem sufficient to exclude a "glandular endometritis" from our terminology. The only effect which interstitial endometritis may have on the glands is compression by the exudate or by cicatricial formation. This may result in some modification of normal menstrual changes, either in the direction of restraining pre-menstrual proliferation, or interfering with post-menstrual involution. It may also in some instances lead to dilatation and cyst-formation, although this is more frequently seen in the otherwise normal, senile endometrium than in one definitely the seat of a previous inflammation. (Fig. 9).

The condition commonly known as membranous dysmenorrhoea, in which the superficial part of the uterine mucosa is expelled during menstruation with severe pain, has hitherto generally been regarded as of inflammatory origin. This opinion was based on the presence of round cells and of more or less necrosis. Hitschmann and Adler, in an examination of 12 cases, never found plasma-cells. This together with the known occurrence of round-celled infiltration in the normal menstruating mucosa, leads them to conclude that the condition is not of inflammatory origin, but results from an abnormal type of menstruation. Ascheim,⁸ in an examination of 7 cases, was never able to isolate organisms. The condition is met with in cases of fibromyoma, chronic metritis, stenosis of the cervix and pelvic inflammation. In menstruation there is a differentiation of the mucosa into compact and spongoid portions, very like that which occurs in pregnancy. In membranous dysmenorrhoea the surface portion is thrown off as a more or less complete layer. This probably results from abnormal density of this layer which prevents the percolation of blood through it or to an excessive amount of haemorrhage in the deeper parts. The expulsion of the membrane is accompanied by severe pain and there is usually an excessive loss of blood.

To sum up, interstitial endometritis is a condition arising post partum, or from gonorrhoea, or other implanted infection, and resulting in an exudate of round cells and pus-cells in the stroma, associated in the early stages with plasma-cells. There is vascular dilatation and later a tendency to thickening of vessel walls and fibrosis of the stroma. Glandular hypertrophy and hyperplasia practically never result.

Symptoms and Physical Signs. The one characteristic symptom of interstitial endometritis is leucorrhoeal discharge. A certain amount of leucorrhoea is normal before and immedi-

8. Zentralbl. für Gyn., 1907, No. 29.

9. Arch. für Gyn. Bd. lxxx-H. 2.

diately after menstruation. This is of thin consistence and clear in colour, and consists of mucous, isolated leucocytes, pavement—epithelium and numerous bacteria. It is a mixture of secretion from the uterine and cervical mucosa, together with vaginal epithelium and bacilli. When an inflammatory condition, with exudate, is present in the interstitial tissue, the leucorrhoeal discharge becomes muco-purulent or purulent, and contains numerous round and pus cells. In the chronic stage the pathogenic organism is seldom isolated, except in gonorrhoeal infections with an associated endocervicitis. If the cervix is exposed by the speculum and all discharge carefully removed from the cervical canal and vaginal portion of the cervix, the presence of an interstitial endometritis may be inferred from the escape of a muco-purulent or purulent discharge from the uterus. Menorrhagia is sometimes present, and so also is dysmenorrhoea. Both of these symptoms are probably due to involvement of the muscular wall, the peritoneum, or the uterine adnexa. Pain in the back and a feeling of weight and fulness in the pelvis, which are often present, are likewise probably due to lesions outside the mucous membrane. On bi-manual examination the uterus is often enlarged, sometimes flaccid, but at other times harder in consistence than normal, and it may be tender. Diagnosis must rest upon the demonstration of the pathological uterine secretion.

Prognosis—The condition is every chronic, especially when due to gonorrhoea, and may persist for years. At any time there may be acute exacerbations, with involvement of the uterine wall or Fallopian tubes. This is especially apt to occur after abortion or full-time labour, and is the explanation of some cases of puerperal septicaemia. As a rule the patient is sterile, and if pregnancy does occur, abortion is frequent as the decidua is unhealthy. It contains many round cells, tends to be soft and congested, and bleeds readily. To the condition the name decidual endometritis is given.

Treatment—The object of treatment in chronic interstitial endometritis is to eradicate the infecting organism, if such be still present, and to promote the growth of a healthy endometrium to replace the one containing inflammatory exudate. These objects are difficult of attainment, and so far no absolutely satisfactory method has been devised. It has long been recognized that cervical infections, especially gonorrhoeal, are very difficult to cure. Similar lesions in the endometrium are still more refractory to treatment. The method most generally employed, and that which gives the most satisfactory results, is the intra-uterine application of some caustic or germicide. Curettage, as a preliminary to this application, is of value in some cases. It has been extensively employed on the assumption that after it a new and healthy mucous membrane would form. This, however, does not usually occur. In recent infections any benefit which may accrue is scarcely balanced by the risk of causing more deeply-seated inflammation. It is not infrequent to find that leucorrhoea is actually more profuse after curettage.

A variety of drugs may be used in making intra-uterine applications. Those which have given the best results are such as are strongly germicidal, but have not too great caustic effect. Formalin, in its ordinary commercial strength of 40 per cent. has given good results. In gonorrhoeal cases nitrate of silver (5 to 10 per cent.), argyrol (30 to 40 per cent.), or albargin (3 per cent.) may be used. Chloride of zinc in a 30 per cent. solution may also be employed, but care must be taken lest it produce deep sloughing, with subsequent cicatrization of the cervical canal. Such topical applications give better results than intra-uterine irrigation, and are less risky than the injection of substances into the uterine cavity.

In making the application a probe dressed with cotton-wool should be used. The cervix is exposed with the bivalve or Sim's speculum, and steadied with a tenaculum. It should not be forcibly pulled down. Any secretion clinging to the vaginal portion and in the cervical canal is removed with cotton wool soaked in a solution of bicarbonate of soda. If the mucous is very tenacious it can be loosened and easily removed by allowing such a pledget to remain in

contact with the cervix for a few minutes. As a preliminary, a sterile sound is introduced to determine the patency of the canal and the direction of the uterine axis. In some cases it may be necessary to dilate the cervix with one or two of the finer graduated dilators, and in such it may be necessary to give an anaesthetic. The dressed probe is then introduced, and left in for one or two minutes.

After the application, a tampon saturated with a 10 per cent. solution of ichthyol and glycerin should be introduced below the external os. This prevents the drug employed from flowing down on to the vaginal walls and vulva. It may be removed by the patient herself on the following day. The treatment should not be repeated oftener than once in five or six days, and in the intervals between treatments mild antiseptic vaginal douches, such as 1 in 5,000 bichloride of mercury solution, should be used. If there is a tendency for pus to accumulate in the uterine cavity repeated slight dilatation of the cervix may be required.

General therapeutic measures should also be employed. As we have seen, it is rare to have a chronic endometritis uncomplicated by other lesions in the uterine wall or appendages. Absolute rest in bed is not required, but any excessive exertion ought to be avoided. Long continued standing tends to aggravate the condition by favouring pelvic congestion. The bowels should be carefully regulated, and all irritating articles of food and drink, and especially alcohol, forbidden. An iron tonic is frequently indicated. If the uterus is displaced and freely movable the displacement ought to be rectified and a pessary worn, if this can be done without pain. The pelvic circulation is stimulated by hot vaginal douching, and the glycerin and ichthyol tampon which is employed tends to deplete the tissues. Scarification of the cervix used to be employed with the same object, but is now seldom used. The application of steam to the interior of the uterus was a method advocated by Pincus. It is now seldom used, but heated air is still employed by some. For its application a special apparatus is required. Various devices for the induction of Bier's passive hyperaemia in the cervix and uterus have from time to time been devised, and good results have been reported from them.¹⁰ They have never been extensively employed in this country, and I have no experience of them.

GLANDULAR HYPERTROPHY AND HYPERPLASIA

As opinion is not yet unanimous regarding the aetiological relationship between inflammation and glandular hypertrophy and hyperplasia, it has been thought right to discuss the latter in the present article. It will be gathered from the preceding pages that I agree with Hitschmann and Adler, Theilhaber, Meier, and others that while glandular hypertrophy and hyperplasia are sometimes associated with a definite inflammatory lesion, they are not caused by it. Further, it must be remembered that a great many conditions formerly regarded as pathological hyperplasia must, in the light of recent research, be considered merely as phases in the normal menstrual cycle. In order adequately to appreciate the significance of the glandular picture it will therefore be necessary briefly to outline the changes normally occurring in the glands throughout this cycle.

In the normal uterine mucosa the glands are simple tubular structures, running more or less obliquely to the surface, and penetrating sometimes as deeply as the superficial muscular layer. They are lined by a single layer of columnar epithelium set upon a basement membrane. Their number, and the closeness with which they are set in the stroma, vary with the age of the patient. They are scanty and widely separated in the child, more numerous and closely set during active sexual life, and again fewer in number after the menopause. At all ages there are wide individual variations, so that it is difficult or impossible to fix a definite physiological standard. As a working basis the membrane may be regarded as normal when the glands are from four to five times their own diameter from one another, when they are fairly

10. This will be found described in the article on Therapeutics, Vol. iii, p. 779. The New Gynaecology, Eden & Lockyer.

wide and straight, or only slightly tortuous (Figs. 1 and 2). Deviations from this standard occur during certain phases of the menstrual cycle, and are therefore physiological, and are

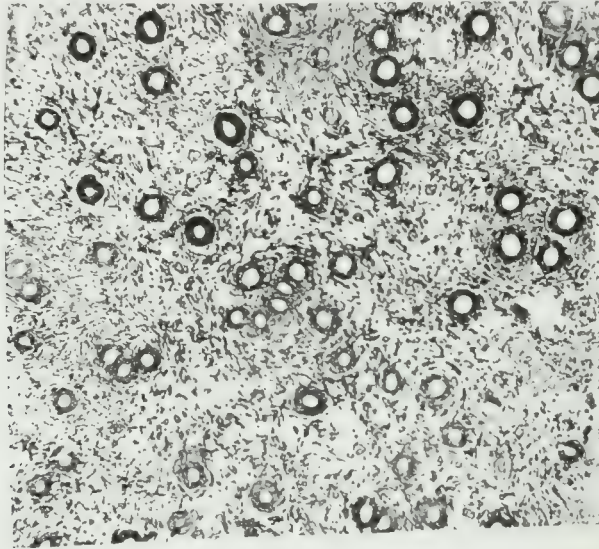


FIG. 1.— Normal uterine mucous membrane removed by curette two weeks after menstruation. The glands are narrow, circular in outline and widely separated. (Low Power).

also present in pathological hypertrophy and hyperplasia. By hypertrophy is meant a condition of dilatation or tortuousness of the glands. Hyperplasia is an increase in their number, often associated with excessive proliferation of the lining cells.

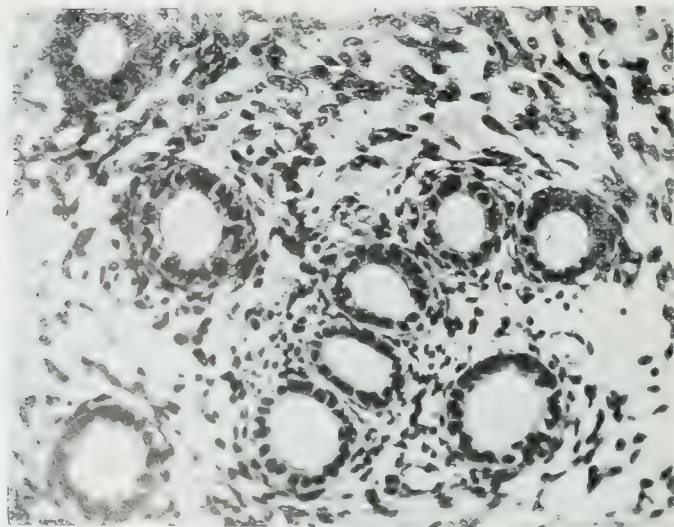


FIG. 2.—Higher-Power view of section shown in preceding figure. Note the circular outline of the glands; the low columnar gland-epithelium with central nucleus; the absence of secretion in the lumina.

Glandular Changes in the Menstrual Cycle—Changes in the stroma of the endometrium in connection with menstruation have long monopolized attention. That the glands also undergo definite modification at different periods of the cycle has been clearly demonstrated by Hitschmann and Adler. Their work has been confirmed by Theilhaber and Meier, and Hartje,¹¹ working independently, and has been very generally accepted, with slight modifications.

The uterine mucous membrane is never at rest, and the microscopic appearances differ widely at different stages in the menstrual cycle. For descriptive purposes this cycle may be divided into four phases; pre menstrual, menstrual, post menstrual and interval.

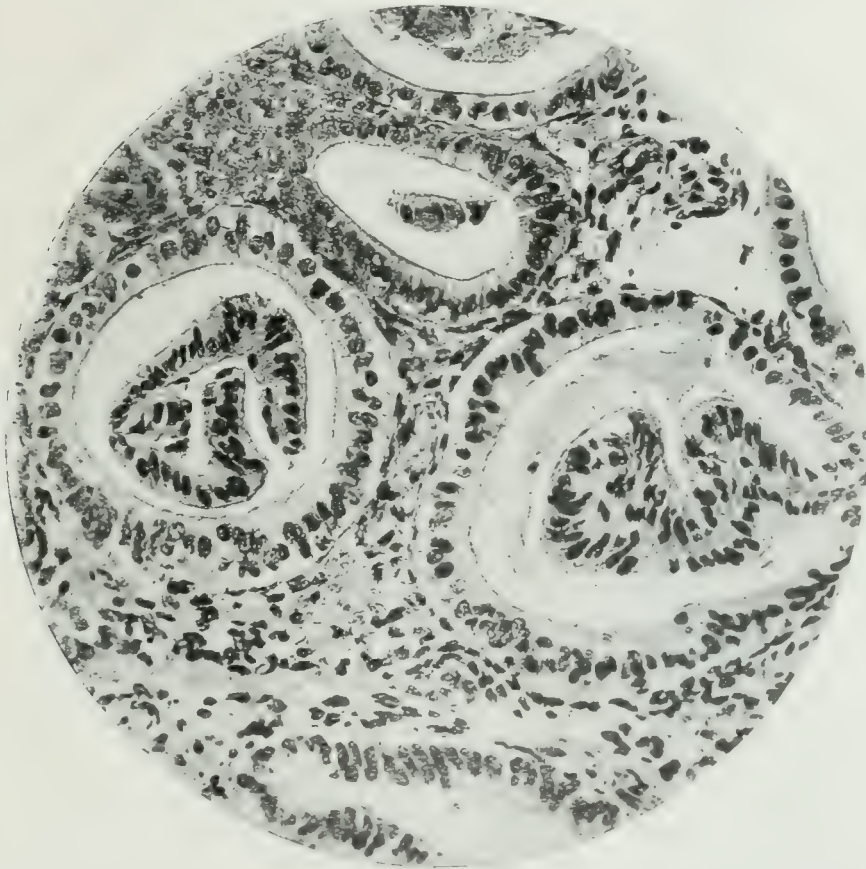
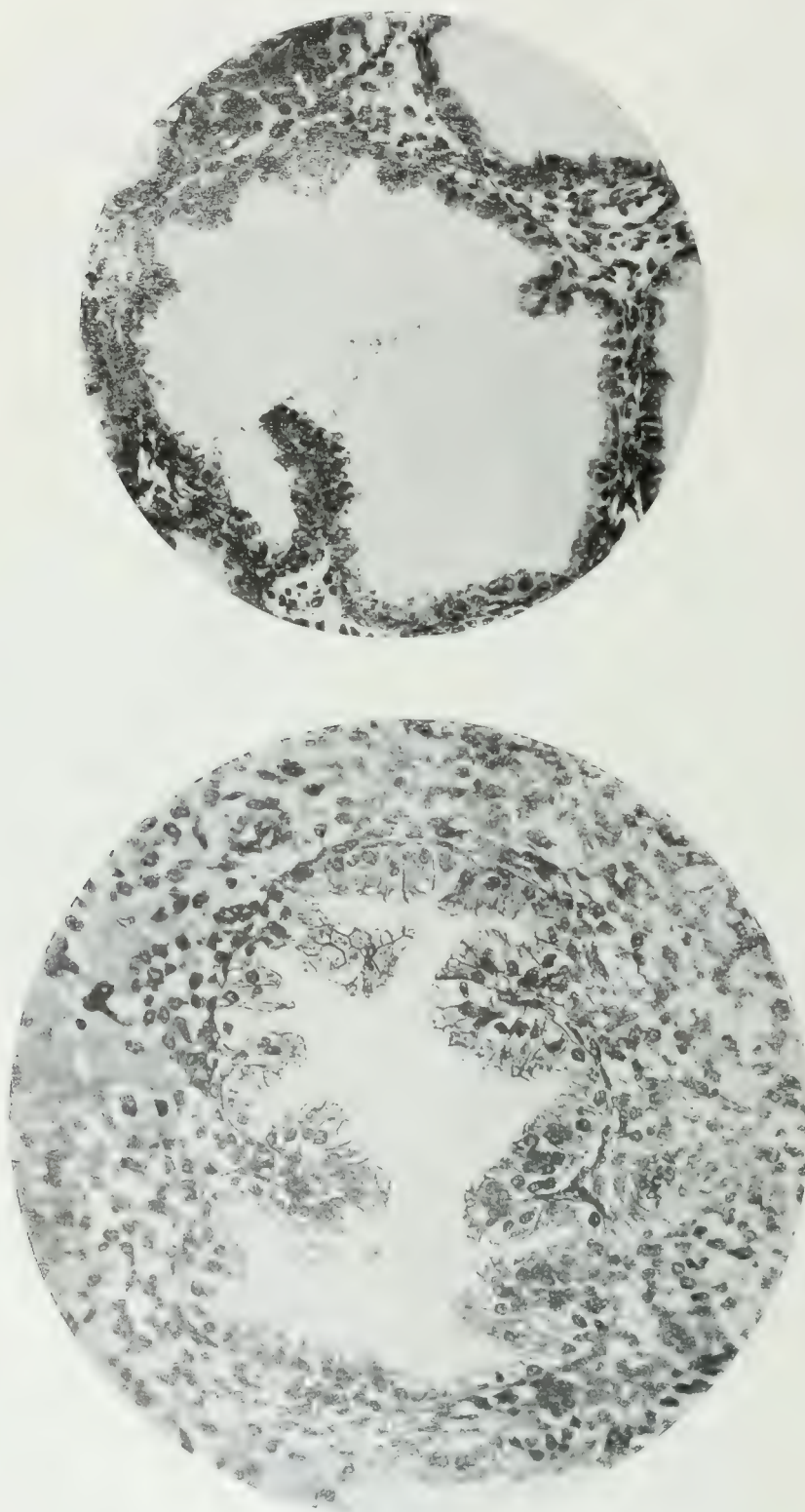


FIG. 3.—Section of uterine mucous membrane removed by curette during the post-menstrual phase showing the appearance of glands within glands. At the right of the figure note that this appearance is due to infolding of the collapsed gland wall. (High Power).

The pre-menstrual phase begins about the seventh day prior to menstruation, and lasts until the beginning of the flow. It is characterized by hypertrophy of the glands, resulting in dilatation. Epithelial buds and papillary processes project into the lumina, giving the glands a saw like appearance on section. The enlarged glands are closer together, and may be almost back to back, so that the intervening stroma appears to be diminished (see Fig. 7). Sometimes there are invaginations into the lumen, giving an appearance of a gland within a gland on section (Fig. 3). The cells are enlarged and swollen, and their free margins no longer form a definite line limiting the lumen, but present a ragged appearance (Figs. 4 and 5).

11. Monats. für Geburts. und Gyn. Bd. xvi.; Zentrabl. für Gyn., 1907, p. 1165.



gs. 4 and 5.—Uterine glands from mucous membrane removed by curette two days before expected menstruation. Note the irregular contour, the papillary projections, the irregularity of the free margins of the cells, the height of the latter and the depth of the nuclei. (High power).

This is due to the establishment of their secretory function. At this stage a mucicarminic positive substance is present in the cells and in the lumina. The number and size of the papillary projections and epithelial tufts vary in different cases, as also does the degrees of dilatation and tortuosity (Figs. 6 and 7). In normally menstruating mucous membranes the general appearances are, however, very constant.

With the onset of menstruation the gland-cells collapse, discharging their contents into the lumen, and thence it escapes into the uterine cavity. The gland lumen as a result contracts, and the gland becomes less tortuous. Individual cells undergo destruction, and are represented by fragments of nuclei lying between the other cells. This cellular degeneration may be evident immediately before menstruation.

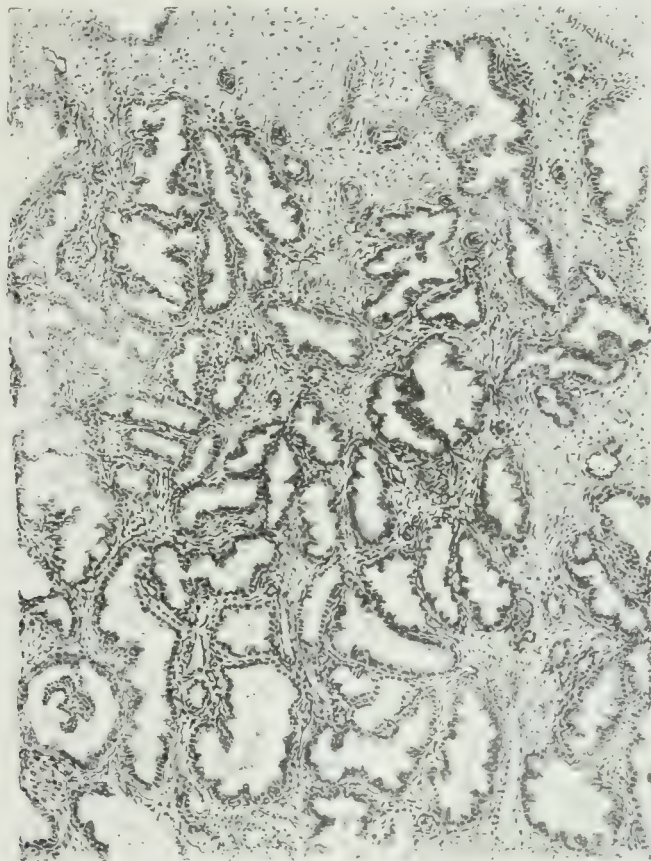


FIG. 6.—Uterine mucous membrane in pre-menstrual phase, showing appearances formerly described as "Glandular Endometritis." Note the closeness of the glands, their dilatation, irregular contour, the inward projection of the gland-epithelium, and the presence of secretion. (Low power).

In the post-menstrual phase the gland-lumina are narrow and widely separated, the cells small, with their free margins forming a regular line, and there is no muci-carminic positive substance present. (Fig. 2).

In the early interval mitoses begin to appear in the gland-cells and the glands become slightly dilated. In the middle interval mitoses are more numerous, the glands are dilated and tortuous, and secretion is present in the cells. In the late interval signs of secretion are prominent, the lumina are widely dilated, and mitoses are more scanty. This leads on to the pre menstrual phase, with the tuft-like and papillary arrangement of the epithelium, and the filling of the lumina with secretion.

These various phases merge gradually into one another without definite demarcation, and probably there is no period of complete rest. In the normal case, however, it is usually possible to determine approximately the phase during which the mucosa has been removed.

In interpreting the appearances presented under the microscope it is therefore necessary to take account of the time in relation to menstruation at which the mucosa was obtained, so that we may not class as pathological a condition which may well be within physiological limits. In judging of this it is necessary to know the constancy of occurrence of those various phases, and at present the want of an exact knowledge on this point is the greatest difficulty

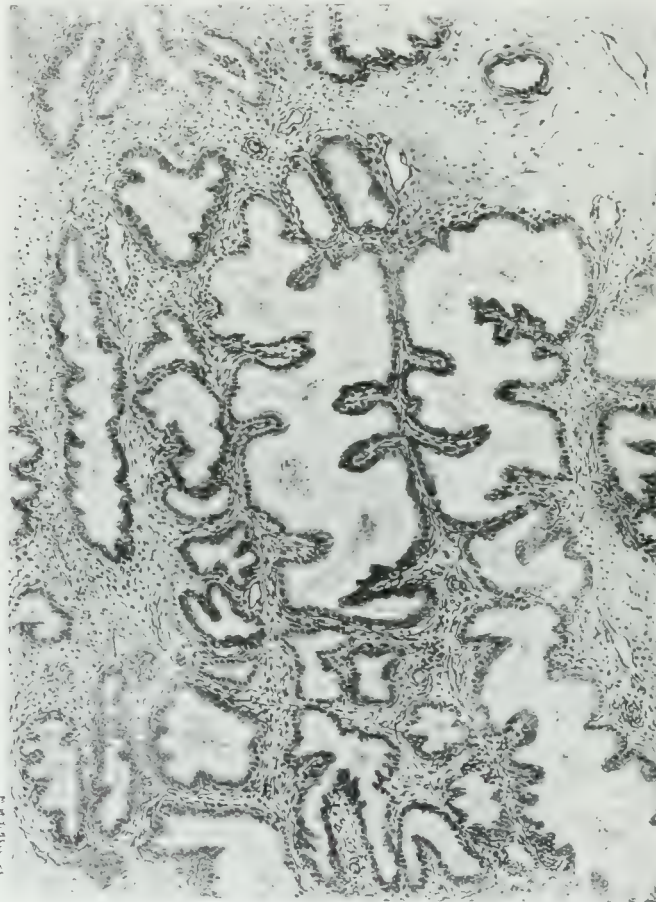


FIG. 7. Uterine mucous membrane removed by curette three days before expected menstruation. Note the tortuosity and dilatation of the glands, the papillary projections into the lumina, and the presence of secretion. (Low power).

in interpreting the microscopic picture. It would appear that the more closely these glandular hyperplasias are studied in relation to the menstrual cycle, the greater become the number of cases which can be classed as physiological. The dilated and tortuous glands, with saw-like papillae and epithelial tufts in the interior, often almost back to back, with little intervening stroma, are typical of the normal pre-menstrual phase, and reproduce exactly the picture of what has hitherto been termed hypertrophic and hyperplastic glandular endometritis.

But when all this is granted, there yet remain a certain number of cases of glandular hypertrophy and hyperplasia which cannot be explained on a normal menstrual basis. To a consideration of these attention will now be directed.

In the first place it is sometimes found, in uterine scrapings removed after menstruation, that all or many of the glands present appearances characteristic of the pre-menstrual phase, that is, they are in a condition of hypertrophy and hyperplasia, when we would expect them to be small and collapsed. According to Hitschmann and Adler, those appearances are in most instances to be explained by retardation of the normal involution process, or more frequently by irregularity of menstruation. This latter results from irregularity in the ovarian function which controls it. Any variation in ovarian function will express itself in variation in the alteration of the phases of the uterine mucosa. In cases of regular, but long protracted, menstruation it is not uncommon to find a hyperplastic condition of the glands when curetting is done towards the end or after the cessation of the flow. This may be explained by supposing that the stimulus which leads to the increased duration of menstruation interferes with the normal involution of the glands. Many of the glands in such cases are in a condition of partial involution. They are collapsed, the lumina are narrow, and they are often tortuous, so that they are apt to be confused with the appearances presented by an active pre-menstrual hyperplasia. When menstruation is irregular, the regularity of the cyclical changes in the mucosa is lost. Definite stages do not follow each other symmetrically, and all stages of glandular development may be present in one microscopical preparation (Fig. 8). Such appearances should not be interpreted as primarily pathological, but as an expression of derangement of the influences,—chiefly ovarian—which control menstruation. In other words, the pathological condition of the mucosa is not the cause of the irregular menstruation, but both are dependent on a common cause. As we shall see later, glandular changes in the mucosa have little or no influence on menstruation, or in causing menorrhagia, which is just what would be expected if the foregoing facts are correct. It would appear that the only influence modifying the alternation of phases, with their typical glandular pictures, is ovarian. There is no evidence that inflammation or local irritation, as by tumor growth, has any effect upon it.

Apart from those cases of irregular menstruation in which there is a mixing of the phases of glandular development, there are appearances observed in some uterine mucous membranes which must be regarded as more or less pathological. The mucosa for instance may show the proper phase-picture, but with an exaggerated hyperplasia, either in the form of group-formation of glands or of invaginations. Invagination of the walls of the glands, giving rise to an appearance on section as in Fig. 3, is generally regarded as pathological. It is doubtful, however, if it is of much clinical significance. Its production may be due to relaxation after maximum dilatation of the glands. These invaginations are more often seen in mucous membrane removed by the curette than in specimens cut along with the uterine wall. Schroder¹² found them in 77 out of 91 curettings, and only in 1 out of 29 extirpated uteri. This points to the condition being in many cases an artefact.



FIG. 3. Uterine mucous membrane removed ten days after menstruation from a patient in whom menstruation was very irregular. Different glands exhibit different states of activity.

12. Arch. fur Gyn., 1912, Bd. xcvi, p. 31; and lxxxviii, p. 1

Another condition which can only be regarded as abnormal is marked cystic dilatation of the glands (Fig. 9). This is often seen in the mucosa of women approaching and past the menopause. It is not infrequent in the cases of fibroid tumours of the uterus (Fig. 10), and may be met with in an otherwise normal mucous membrane. In some cases it appears to be due to an obstruction of the gland-mouth; but in others is evidently not mechanical, for the lining cells are not compressed, but apparently in active growth. It is of no clinical significance as far as symptomatology is concerned.

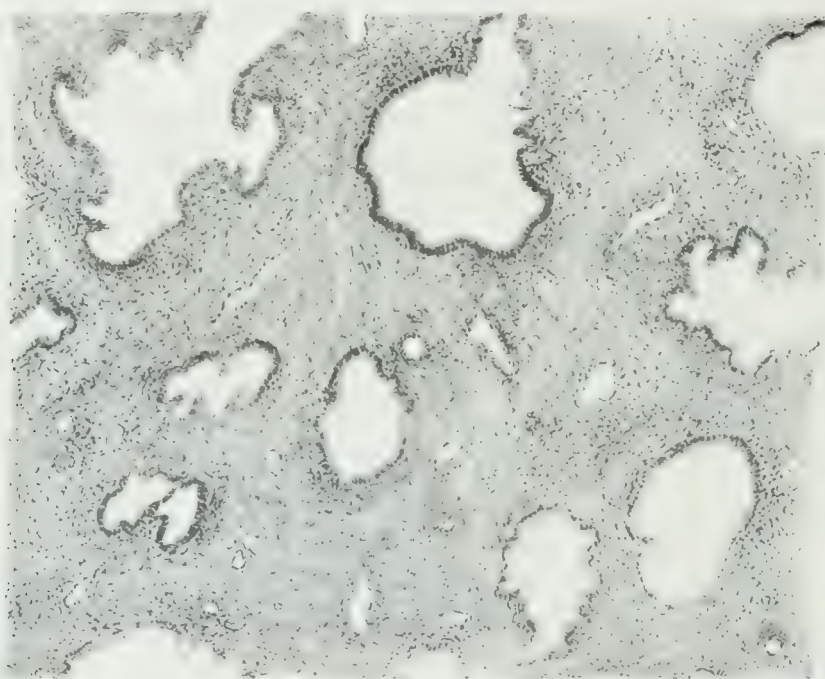


FIG. 9. Mucous membrane from a patient forty-three years of age. The stroma is fibrous, and some of the glands are widely dilated. Low power.

There is another condition which Albrecht¹³ has termed "stationary hyperplasia." In this the mucous membrane undergoes no change of phase. The glands are increased in number, and may be back to back. The lumina are wide and usually empty. There may be tuft-like projections of the epithelium into the cavity, but there is no evidence of secretion. The whole appearance suggests an adenomatous proliferation.

In glandular cystic hypertrophy, often termed villous endometritis or endometritis fungosa, the mucous membrane of the uterus is greatly thickened, and thrown into cushion-like folds and papillary projections. The whole area of the mucous membrane of the body of the uterus is affected, giving rise to an appearance very like that of cancer of the body (Fig. 11). Microscopic examination shows an increase in all the constituents (Fig. 12). The glands do not pass through the regular cyclical transformation, but usually present an appearance corresponding to the post-menstrual phase, and there may be a considerable amount of cystic dilatation. Plasma-cells or other signs of inflammation are usually absent. It is most commonly met with at or near the menopause, but sometimes in young women. Of 18 cases described by Büttner, 4 were in the fifth decade, 2 were 17 years old, 3 were between twenty-two and twenty-four, and 2 were in the fourth decade. According to Büttner, it is due to abnormal ovarian function of the same nature as, but of more marked degree than, that

13. Berlin *Arch. W.*, 1911, Vol. XLIX, 1000.

giving rise to irregular menstruation and displacement of phases. It is usually associated with severe menorrhagia, but there is no evidence that this is directly attributable to the condition of the mucous-membrane. That there is deranged ovarian function is evidenced by the fact that long periods of amenorrhoea may alternate with severe haemorrhages, as in the patient from whom the uterus shown in Fig. 11 was removed. Clinically it must be distinguished from adeno-carcinoma and malignant adenoma of the body of the uterus. The haemorrhage is often so intractable as to necessitate extirpation of the uterus.

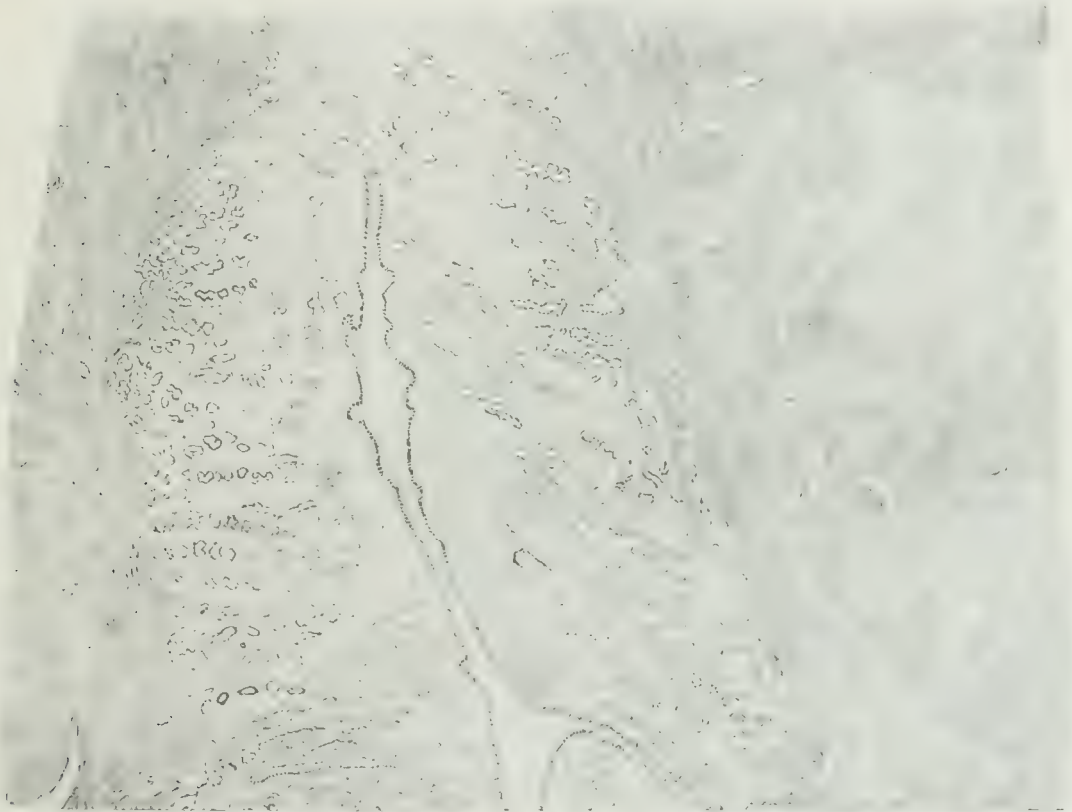


FIG. 10.—Mucous membrane and part of muscular wall of uterus containing an interstitial fibroid tumour. The mucosa is thick and some of the glands are dilated, but there is no marked hypertrophy or hyperplasia. The patient suffered from severe menorrhagia. (Low power).

Localized hypertrophy of the mucous membrane, with glandular proliferation, gives rise to the formation of mucous polypi. They may be present at any age, but are more frequent in late than in early sexual life.

AETIOLOGY OF PATHOLOGICAL HYPERTROPHY AND HYPERPLASIA

Careful analysis of long series of cases, in which the uterus has been curetted, fail to prove any aetiological relationship between conditions hitherto thought to be responsible and glandular hyperplasia. Reference has already been made to the fact that inflammatory lesions of the uterus or other pelvic organs are not to blame. It is possible that a hyperaemia, apart from menstruation, may result in increase in the number and in the activity of the glands. Apart from such hyperaemia uterine displacements have little or no effect. Büttner, in an analysis of 87 cases of retroflexion and 9 of prolapse, found an excessive development of the

glands present in 20.8 per cent. whilst in 106 normally placed uteri, it was present in 16.4 per cent. Hypertrophy and hyperplasia are present in 50 per cent of uterine fibroids (Schickele and Keller), and there is a tendency to cystic dilatation and convolution and invagination of the glands. The absence of definite knowledge regarding its cause is not strange when we consider that the same may be said of other forms of new growths. The theory that many of the cases are due to disordered ovarian function seems at the present time the most rational one.



FIG. 11.—Uterus showing 'glandular cystic hypertrophy' of the mucous membrane. Hysterectomy performed on account of intractable haemorrhage persisting after curettage. Note the cystic character of the ovary and the tubo-ovarian adhesions.

Symptoms—As recent investigation has shown that the number of cases in which a pathological glandular hypertrophy and hyperplasia is present is much more limited than used to be supposed, so research has proved that the condition is not responsible for many of the symptoms formerly ascribed to it. Menorrhagia, dysmenorrhoea, leucorrhoea, sterility or frequent abortion, pain in the back, dyspepsia and constipation, are some of the symptoms which have been ascribed to so-called glandular endometritis, or, as we now call it, glandular hyperplasia. This group of symptoms is certainly common, associated with a uterus either normal in position or displaced, sometimes harder in consistence than normal. A diagnosis of endometritis is commonly made on such a clinical picture. Curettage is performed, an examination of the curettings made and more or less glandular hyperplasia found. Hitherto the latter has been accepted as a sufficient explanation of the symptoms complained of. Critical examination of such scrapings, in the light of our present knowledge, fails, however, to confirm this view. All recent writers on the subject, many of them differing from each other regarding the aetiology of glandular hyperplasia, are agreed that there is no direct causal relationship between such hyperplasia and excessive bleeding. According to Büttner only 15 per cent. of women between twenty and thirty years of age with profuse menstruation show glandular

hyperplasia, whilst it is present in 8 per cent of normally menstruating women of the same age. In women below twenty years of age 11.1 per cent. of those with excessive menstruation show glandular hyperplasia. Schickele and Keller, in an investigation of 116 cases of menorrhagia of various types, found abnormal glandular changes in only 11. Cases of glandular cystic hypertrophy or villous endometritis, whether occurring in early or late sexual life, are associated with excessive uterine haemorrhage, but that this haemorrhage is not primarily due to the condition of the mucous membrane is shown by the frequent failure of curetting

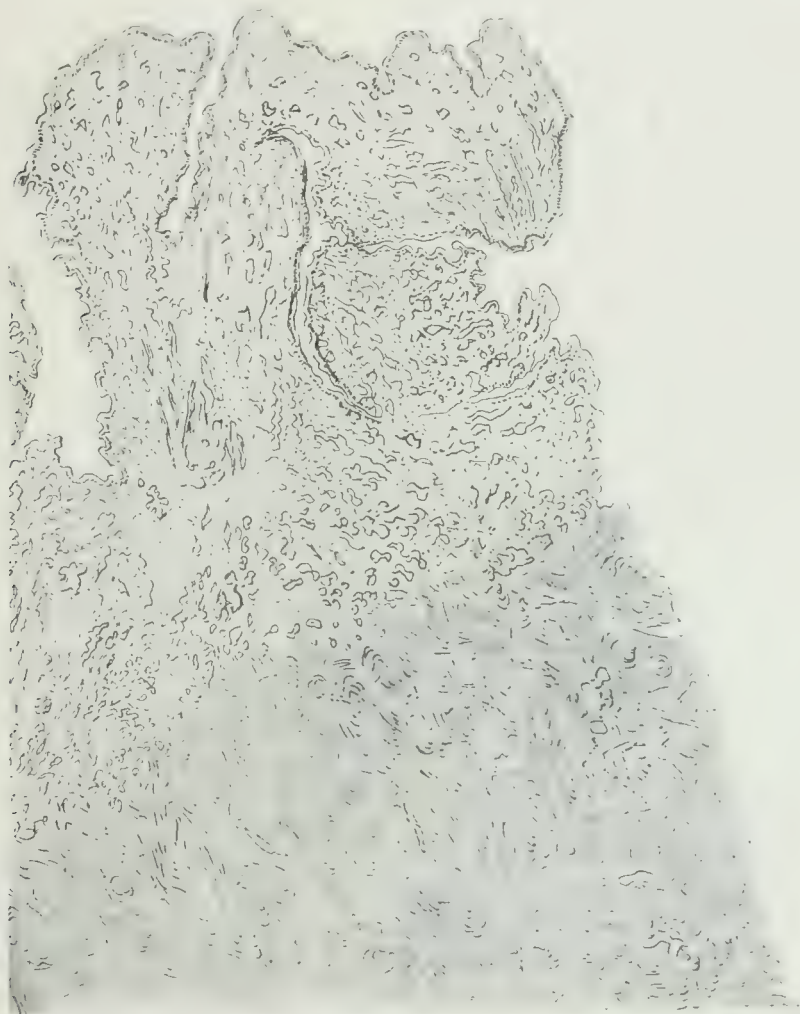


FIG. 12.—Section of mucous membrane from uterus shown in preceding figure. It is thicker than normal, but there is no marked glandular hypertrophy or hyperplasia. (Low power).

to effect a cure. In the excessive haemorrhages which sometimes occur at the time of puberty only normal or subnormal glandular development is the rule. The figures quoted bear out what everyone who has examined numbers of uterine scrapings has found, namely, that there is no constant relationship between menorrhagia and the glandular picture. Menorrhagia, when present, must be due to some other condition, either of the mucous membrane or the uterine adnexa.

Vascular dilatation and thickening of the vessel wall in the endometrium (b) have been held responsible by some. Loss of muscular power in the uterus due to an excessive fibrosis, may be the cause. Outside the uterus the ovary is chiefly, some hold entirely, responsible for disturbances of menstruation. Derangement of its function results in disturbance of the menstrual cycle, and is therefore probably responsible for both the abnormal haemorrhage and the abnormal glandular picture, which are sometimes associated. In addition to the ovary the other organs of internal secretion probably play a part. The haemorrhage which occurs in cases of myoma of the uterus has been ascribed in part to the glandular proliferation sometimes associated with it. This glandular proliferation is not so frequent as used to be supposed, and menorrhagia is not more common in cases where it is present than in those where it is absent. It is generally recognized that in women with fibroids, menstruation tends to persist till late in life. This must be due to ovarian influences rather than to any abnormal condition of the mucosa, and we know how frequently pathological conditions of the ovary are present in such cases.

It would appear therefore that glandular hyperplasia is not a direct cause of excessive uterine haemorrhage, but that both may be due to a common cause, probably ovarian. Hyperthyroidism is generally recognized as a cause of menorrhagia, and the secretions of the other ductless glands may also have some influence. According to Blair Bell, an altered calcium metabolism may be the cause in some cases.

There is nothing in the microscopic appearance of the uterine mucosa in cases of glandular hyperplasia to explain the occurrence of dysmenorrhoea or pelvic pain. When such is present it must be due to some condition of the muscular or peritoneal wall of the uterus, or to some inflammatory or congestive lesion of the uterine appendages.

Leucorrhoea results from glandular hyperplasia, as it occurs in the pre-menstrual phase. Many women have an increased amount of secretion before and after menstruation. In hyperplasias of pathological degree one would therefore expect to find leucorrhoea as a prominent symptom. It is indeed present in some, but by no means in all. The reason for this is that in many of the cases of stationary hyperplasia and chronic cystic hypertrophy the cells of the glands apparently have little secretory function. Substances staining with mucicarmine are usually absent from the cell-body and gland lumina. When leucorrhoea is present as the result of an uncomplicated glandular hyperplasia it takes the form of a thin watery discharge, alkaline in reaction, always more profuse before and after menstruation. In the absence of definite interstitial endometritis it contains no pus cells.

Sterility and abortion usually result when the mucosa of the uterus is in an abnormal condition, and does not pass through the normal menstrual cycle, the pre-menstrual phase of which many regard as a preparation for the embedding of the ovum.

The general symptoms above mentioned are probably the result of associated conditions of the uterus and adnexa rather than of the mucous membrane itself.

Physical signs are as indefinite as symptoms, and of as little value in diagnosis. The demonstration of a mucous discharge in excess of normal, coming from the interior of the uterus, may lead us to suspect some glandular hyperplasia, but, as we have seen, its absence does not exclude the condition. On bi-manual examination the uterus may be found to be enlarged, soft, and tender. There is frequently an associated cervical catarrh and erosion, but such may be present, especially in nulliparous women, without any glandular hyperplasia in the endometrium.

Diagnosis—A consideration of the foregoing observations makes it clear that there is no certain way of diagnosing glandular hypertrophy and hyperplasia apart from microscopic examination. There are no characteristic symptoms among the many of which the

patient may complain, which are pathognomonic of glandular increase. In making the diagnosis by the microscope it is necessary to have exact information regarding the menstrual history. The only conditions liable to be confused with it are adeno-carcinoma and malignant adenoma of the endometrium. The latter especially may give rise to considerable difficulty, as the glands retain their form, and there may be no evidence of malignant action in the form of plugs of cells invading the stroma. The closeness with which the glands are set, the absence of secretion from their interior and from the cell bodies, taken along with a history of menorr-

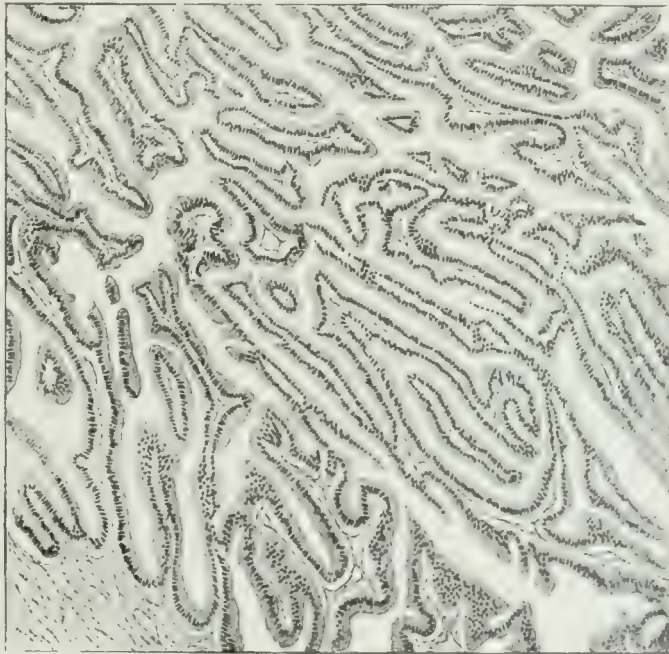


FIG. 13.—Mucous membrane from a case of malignant adenoma of the uterus. Sections of the uterine wall show deep penetration of the glands into the muscular coat. (Low power.)

hagia and irregular uterine haemorrhage, occurring in a patient about the age of the menopause, ought to make one suspicious. Fig. 13 is a section from such a case. The uterus was subsequently removed, when it was found that there was a very extensive invasion of the muscular wall by the glandular epithelial proliferation. In adeno-carcinoma there is a breaking through of the basement membrane of the glands by epithelial masses, in the cells of which mitotic figures may be present. In simple glandular hyperplasia the basement membrane is always intact, and any heaping up of epithelial cells occurs towards the lumen.

Treatment of Glandular Hyperplasia As we have seen, glandular hyperplasia in itself is not a condition which gives rise to any marked symptoms. It should not therefore call for any special treatment. The object in such cases should be to treat the cause of the hyperplasia, and of the symptoms associated with it. What those causes are is by no means definitely settled. We may say that it is in most instances a derangement of ovarian function, but until we know something more of ovarian physiology and pathology this helps us little. Thus it is that our treatment is still more or less empirical and symptomatic.

With the old conception of the pathology and symptomatology of glandular endometritis curettage was regarded as the sovereign remedy. Later conceptions of the condition have led to a systematic study of the results obtained by curettage in such cases. These investigations go to show that only in a small number of cases is it followed by definite disappearance of symptoms. Busse¹⁴ reports on 500 cases, and in only 10 per cent. did cure of menorrhagia result from curetting. Schickele and Keller had failures in 60 per cent. In the 40 per cent. that were cured only 10 per cent. showed glandular hyperplasia. When cure of menorrhagia has resulted from curettage it has been supposed that the presumably pathological mucosa removed has been replaced by one normal in structure. Werth,¹⁵ however, points out that if glands were abundant in the curetted membrane they are equally abundant in the regenerated one. It is therefore doubtful if the benefit which follows in the 10 per cent. of cures is due to the removal of the mucous membrane or to some other effect on the pelvic organs. When excessive haemorrhage is due to an incomplete abortion or retention of fragments of placenta or membrane after parturition, the cure which follows curettage is directly attributable to the removal of the abnormal tissue, which is not reproduced during the subsequent regenerative process. These are practically the only cases in which a cure of excessive haemorrhage can be confidently expected as a result of the operation. In the haemorrhages of puberty it usually has no effect, and most authorities now discountenance it in such cases. The operation will still continue to be performed in cases presenting the clinical picture of so-called glandular endometritis, but it will be with the object of establishing a diagnosis rather than of effecting a cure. There can be no question that curettage is too lightly and too often employed. It may be of benefit in so far as it usually involves rest in bed for some time after, and during that time the patient is given the benefit of general and local treatment. Such treatment is of the utmost importance, and may result in relief of symptoms without recourse to operation. Curettage also may relieve symptoms by depleting the uterus, and giving a fresh start to retarded involution after abortion or child-birth. Clinically there can be no doubt that an enlarged, heavy uterus tends in many cases to diminish in size after the operation.

Some of the cases of irregular menstruation and excessive haemorrhage are due to lesions of the ovary and the tubes, and the appropriate treatment of these often results in the re-establishment of the normal menstrual function.

In glandular cystic hypertrophy haemorrhage is generally so persistent and intractable that extirpation of the uterus is necessary. In other cases, which resist ordinary treatment, the menstrual loss may be reduced to normal limits by the excision of a wedge shaped portion of the uterus. Benefit has been reported from the action of X-Rays and radium. (c) This treatment is more suitable for patients near the age of the menopause than for younger women, as permanent atrophy of the ovary may result.

Local and general treatment, such as is mentioned in connection with interstitial endometritis, should in all cases be carried out, whether any operative procedure is used or not.

14. Frantz Veit, *Ergebnisse der Geburts. und Gyn. Bd. ii.*, 1910.

15. Cited by Hitschmann and Adler, *Arch. f. Gyn.*, 1913. (a) *The New Gynaecology*, Eden & Lockyer, Vol. 1., p. 528. (b) *The New Gynaecology*, Eden & Lockyer, Vol. ii.; p. 117
(c) *The New Gynaecology*, Eden & Lockyer, Vol. iii.; p. 837.

PARALYSIS OF DIVERGENCE*

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A short time ago, when I presented a case of divergence paralysis at a meeting of ophthalmologists in New York, I was struck by the lack of familiarity with the conditions which most of those present manifested. Some who attended the meeting were surprised that the patient did not show double external rectus paralysis. In talking with neurologists it became evident to me that they were not aware of the existence of a divergence centre, and that some of them were not familiar with the function of ocular divergence, and so had not thought of the possibility of paralysis of divergence. Thus I was prompted to take the liberty of calling this condition to your attention, hoping that some of you have seen clinical cases and that you will report them.

For many years Duane has made careful studies of the functions of convergence and divergence, and he more than anyone else has insisted on the importance of a distinction between the function of convergence and that of internal rotation of the eyeball (adduction, adversion), and of a similar distinction between divergence of the eyes and external rotation (abduction, abversion). A patient may be able to perform absolutely normal inward rotation of each eye by looking to the right and to the left, and yet may be without the power of normal convergence. Similarly, a patient may be able to perform outward rotation of each eye in a perfectly normal manner, and yet have partial or total paralysis of the divergence power. Too much stress cannot be laid on this point.

Divergence paralysis is a striking condition, and once seen and studied it is always remembered and easily diagnosed. The *onset* is usually sudden, and is accompanied by *diplopia* with its usual distress. This diplopia is greatest for distance, and at close reading range is not present at all. The patient suggests the diagnosis when he says to the oculist that he sees double when looking off at a distance, but that he can see to read all right. A marked convergent squint is apparent. In testing the outward rotations the examiner finds them normal in each eye. If a light is carried toward the patient from a distance the double images seem to gradually approach each other until they fuse when the light is several inches from the eyes. This fusion is referred to by Duane as binocular "single vision by approximation." Now after fusion has been accomplished, if the light is withdrawn, fusion of the images is maintained until the light is several inches further away. Here Duane applies the term "single vision by recession." This maintenance of binocular single vision as the test object is withdrawn from the eye represents the patient's ability to relax his convergence. Relaxation of the convergence, with consequent lessening of diplopia, can be enhanced by having the patient look up. Perhaps the most striking thing brought out in the subjective examination of cases of divergence paralysis is that as the patient looks to the right or to the left there is actually less diplopia than in the primary position, so that when the testing light is carried to the right or to the left the images seem to the patient to approach each other. Thus it is seen the external recti readily perform their part in the conjugate movements. This is in sharp contrast to what happens when the same test is made in a case of external rectus paralysis. As you all know, diplopia is increased as the patient looks to the right if the right external rectus is paralysed, and similarly it increases as the patient looks to the left if the left externus is paralysed, and if both externi are paralysed diplopia increases whether the patient looks to the right or to the left from the primary position.

*Read before the Canadian Medical Congress, Hamilton, May, 1918

Following is a typical example of paralysis of divergence: In February, 1918, a man (W.J.) twenty-five years of age, called at the New York Eye and Ear Infirmary saying that on August 1st, 1917, while digging a ditch, his vision suddenly became confused, and since that time he has seen double at a distance. He was in a hospital three months, but left unimproved. His vision was normal in each eye, and there was no abnormal condition of the interior of either eye. Pupillary reactions were normal. The urine was normal. Wassermann tests of both blood and spinal fluid gave negative results. Neurological examination was negative. The characteristic features of divergence paralysis were well shown. The tropometer showed normal excursions of each eye in all directions. The far point for binocular single vision by approximation was about fourteen inches, while the far point by recession was twenty-four inches. The point of equilibrium was four inches from the root of the nose. The fact that this point of balance was found to be so close probably indicated the presence of an associated convergence excess. Diplopia decreased slightly as the patient looked to the right or to the left, whereas it would increase in looking in one of these directions if there were a paralysis of the external rectus. In this case paralysis of divergence probably resulted from hæmorrhage into the divergence centre, while the patient was under physical exertion.

ETIOLOGY

In order to explain paralysis of the function of divergence, it seems necessary to assume the presence of a divergence centre in the brain and a lesion which affects this centre. No such centre has been localised, but Duane suggests that the probable location is in the vicinity of the nuclei of the sixth nerves, which are close together near the median line in the floor of the fourth ventricle. The behaviour of a case recently seen by Dr. B. W. Key tends to substantiate this suggestion. On March 2nd, a male, fifty-nine years of age, presented himself at Dr. Key's office, complaining that on the previous day while crossing a street he suddenly became dizzy. Immediately afterwards he noticed that he had double vision for distance. Diplopia for distance remained, but objects at near range were single. He could read without difficulty. Dr. Key considered the case clearly one of typical paralysis of divergence. Four days after the first examination this patient showed unmistakable signs of paralysis of the external rectus of the right eye, namely definite limitation of motion outward in the right eye, and marked separation of the images from a test object when carried to the right. Two and a half months before, this patient suffered a serious attack of pneumonia. Duane mentions as possible cause of paralysis of divergence, syphilis, tabes, multiple sclerosis, lead poisoning, cerebral tumour, antecedent pneumonia; but he adds, "in the majority of cases, the affection has occurred without obvious cause, although from the suddenness of development and the permanence of the symptoms it seems not unreasonable to infer that it has been due to localised hæmorrhage." In 1916, Alger reported nine cases of divergence paralysis. He mentioned as causes, cerebral hæmorrhage, cerebral syphilis, tabes and diphtheria.

PROGNOSIS

For recovery from the paralysis the prognosis is bad, as usually the condition persists. For relief from symptoms the outlook is rather good, as usually one eye takes upon itself the responsibility of performing fixation, and the patient slowly learns to disregard the images in the other eye, which after a time constantly manifests convergent squint.

From disuse of divergence, weakness of abduction may result; and there is the possibility of the onset of paralysis of function of the sixth nerves. It should be remembered that divergence paralysis may be a manifestation of a serious organic lesion which may endanger the life of the patient.

TONSILLECTOMY—THE ANESTHETIC PROBLEMS A PLEA FOR GAS-OXYGEN

E. I. MCKESSON, M.D., ANESTHETIST, TOLEDO, O.

From the anesthetist's point of view tonsillectomy is far from a minor operation. Its problems are unique and require an unusual coöperation between surgeon and anesthetist, not only to execute a thorough operation, but to avoid immediate and remote dangers to the patient.

ETHER

We need but mention the disadvantages of ether; its slow induction, pungent and especially irritating effects upon children; its stimulation of mucous secretion with embarrassment of respiration; its increase of the coagulation time of the blood; the greater relaxation of arterioles and increased hemorrhage; and with the recumbent posture in which the operation is usually performed, the resulting difficulty in preventing the inhalation of blood, mucous, and infectious material squeezed from the tonsil.

These are real dangers to which no one is blind. We are beginning to hear of abscess of the lungs following this operation in increasing numbers. Asphyxia from blood-foam blocking the smaller branches of the bronchial tree by the inspiration of a very small amount of blood and mucous, is by no means unknown and has caused the death of patients.

After the operation there is a variable period of ether delirium and vomiting which may aggravate slight oozing into an active hemorrhage.

LOCAL

Local anesthesia, however, impracticable in children, renders the field less bloody and in those cases where anesthesia is fairly complete, it secures the co-operation of the patient without the loss of consciousness. The greater soreness and oedema of the surrounding tissues and the increased danger of postoperative hemorrhage quite neutralizes its advantages over general anesthesia even in its limited field of application.

NITROUS OXID—OXYGEN

The disadvantages of Gas-Oxygen are of a very different character. This anesthetic is more expensive, especially if the surgeon is a slow operator. A suitable apparatus and an anesthetist skilled in its use are essential. The blood is often blown from the mouth in a spray toward the operator. Relaxation of the throat muscles, in some cases, may not be more than in local anesthesia.

The advantages of gas-oxygen in this operation, however, are numerous and important. They will be obvious as the technic is described.

While gas-oxygen may be employed with any technic of operation, the Denman technic is safer, and, of the dissection methods, much easier and shorter. In a recent case in which

a surgeon used this technic for the first time, he was surprised to have done the operation in 4 minutes, including the time of anesthetization. His comment was that he did not know that the operation could be done so easily and with so little blood loss.

Only those features of the operation will be described which are of importance to the anesthetist, since the details of the surgical technic have already been described by Dr. Denman.

EQUIPMENT AND TECHNIC

The patient, if an adult, is given morphine, $\frac{1}{4}$ grain, and hyoscin, 1/100 grain, an hour before operation. Children *above* 3 or 10 years, receive appropriate doses of morphine (1/16 grain) and hyoscin (1/400 grain and up) according to their age and development. The patient is placed in a suitable dental chair with foot rest removed, or in a Denman chair which is manufactured by the Kny-Scheerer Co., of New York. To hold the patient in position during anesthesia, a sheet upon which the patient sits is wrapped snugly about the body, and with the hands in the lap, a strap 1½ inches wide is buckled tightly over the arms at the pelvis to hold the patient securely in the corner of the back rest and the seat of the chair. This is important in preventing flexion at the neck. Another strap passing over the shoulder, under the arm, across the back, then up under the other arm, over the other shoulder and buckling tightly behind the back rest, holds the shoulders against the back rest and permits of adjusting the head rest to any desired position. It is always best to have the head and neck in line with the trunk for free respiration.

The safety of gas-oxygen in the sitting posture cannot be challenged since it is in this position that its safety in the dental office has been established in millions of anesthetics.

The sterile sheet and towels are draped about the patient. The anesthetist stands slightly back of and to the right of the patient with the anesthetic apparatus to the right of the chair and in front of the anesthetist.

The operator sits directly in front of the patient on a low stool, then the chair is raised until the patient's mouth is slightly above the level of the surgeon's eye, the back rest is brought forward enough to make the patient lean slightly forward so that any blood will run out of the mouth.

The nasal inhaler is applied and secured with elastic head gear, the breathing tube attached and pure nitrous oxid is delivered to the inhaler under very slight pressure to make breathing very easy. This is important, especially where adenoids obstruct the nose materially. This seems like a formidable preparation, especially for a child, but it may all be accomplished very quickly and very few children cry, probably because they are allowed to sit up and become interested in the new things and manœuvres. The inhaler is, of course, the first real complication in their minds, but with 4 or 5 breaths of gas which does not smell different to them than air, unconsciousness has overtaken them before they have time to cry or remonstrate.

At the psychological moment, or at the third breath when the gas has gotten the patient confused, the surgeon commands him to open the mouth: the Whitehead gag is now inserted and the mouth immediately covered with a wad of gauze to prevent the inhalation of air.

Consciousness is lost about the fifth breath, which is characterized by a slight stertor and alteration in the character and rythm of respiration. This is the cue for the addition of 5% oxygen with the gas.

While consciousness has been lost, still deeper anesthesia is needed before beginning the operation and the patient's proper mixture of the two gases must be determined, which should occupy from 1 to 2 minutes. This is determined by the respiration, the pupil, the muscular

relaxation, and color; increasing the oxygen percentage sparingly 1 or 2% at a time as the signs of oxygen hunger manifest themselves until the patient breathes smoothly, the pupil becomes fixed and normal, or slightly smaller in size and a moderate relaxation of the muscles ensue. The color of the face will vary from a pink to a cyanotic or rose tint. The color is a poor guide unless markedly cyanotic when other signs will also point to the need of a greater oxygen content in the mixture.

When tranquil anesthesia has been secured, the exhaling valve is tightened and the pressure screw is also tightened to deliver the gases at the nose under enough pressure that (as the wad of gauze is removed from over the mouth) no air will be inhaled through the mouth while the operation is being performed.

From the anesthetist's standpoint it is most important now that the tongue shall be held to the opposite side of the mouth away from the tonsil, in such a position that the patient may not miss an inhalation throughout the operation.

The two snares are applied and tightened upon the tonsils (but not cut off) then the adenoids are removed between them. Blood now comes out over the tongue by reason of the forward sitting position and from the outward flow of the gasses on exhalation through the mouth. The tonsils are immediately removed and the fossae examined to make sure that all tonsil tissue has been removed which in this position, with a clear view, can be readily determined.

Oxygen is now administered without swabbing or pressure in the fossae to check oozing until the patient has taken 5 or 6 breaths. The oxygen does two things. It quickly restores contraction of bleeding vessels, stopping oozing in a spectacular manner and restores consciousness very quickly. The prompt checking of the hemorrhage is, of course, also aided by the shortened coagulation time of the blood in gas-oxygen anesthesia.

This technic permits of a continuous anesthesia and an uninterrupted operative period. It overcomes the tendency of over dosing the patient in order to secure a prolonged operative interval as in "open ether" with the cone. It practically eliminates the possibility of inspiring blood, mucous, and infectious material. Until the operation is completed bleeding is almost negligible which therefore, expedites and simplifies the thorough removal of the tonsils.

In cases of status lymphaticus, which are occasionally brought for this operation, the dangers of asphyxia under ether or chloroform are overcome by having oxygen ready for use, and with the proper anesthetic apparatus, the ability to force it into the lungs past the thymus obstruction immediately performing the only efficient artificial respiration possible in these cases; and doing so when they can be very readily restored.

ECLAMPSIA

D. A. KIDD, M.D., ATWOOD, ONT.

This is a subject worthy of much thought, since cases vary and sometimes terminate suddenly. Primiparae especially require careful consideration, and should be warned to keep on the look-out for manifestations of kidney disturbances. Of course, multiparae also are not immune from the syndrome of Eclampsia.

With symptoms presenting, the measures to be used are diuretics, purgatives, bromides, chloral, bleeding, morphine, chloroform and delivery. If high blood-pressure is noted in a pregnant woman, whether or not there be albumen in the urine, apply the first two measures—diuretics and purgatives. Exclude meat and salt from the diet, permitting only milk and its derivatives. If labour be over, do not use normal saline for breast infusions, or per rectum, fearing too much hæmorrhage. Eclampsia being diagnosed, catheterize at once and make an urinalysis; also take the blood-pressure. Diuretics and purgatives relieving the kidneys and bowels may be all the treatment required, but should the symptoms not thus be abated, give chloroform and deliver. Dilate the os by the fingers if possible. The bleeding following delivery should relieve the toxæmia. Bromides and Chloral per rectum may also be given. If the foregoing treatment does not relieve the condition, the patient being in a state of stupor or coma, then give hypodermically Morphine grs. one-eighth every one to two hours until grs. one-half be administered in 6 to 8 hours. Some observers condemn the use of Morphine since it inhibits excretion, a contra-indicatory step in our advised treatment, but it is a generally accepted fact that Morphine will calm the nervous system as nothing else will. If then the convulsions be eliminated by keeping the nervous system at rest, one has an opportunity to stimulate the kidneys and bowels to carry off the toxæmic excretions which, by acting on the nervous system, are the cause of the convulsive seizures. On the other hand, if convulsions are allowed to continue, a state of stupor, coma and death from shock is apt to follow. There are cases that will puzzle the most skillful. A few of the latter category which have come within the experience of the writer follow.

CASE 1. Mrs. McG. aged twenty-eight years, Canadian. Family history was not noted. Personal history nil. She was a well-nourished woman, medium in build. Her only symptom of note was an occasional pain on the top of her head. Convulsion took her while out gathering chips. After this first attack she walked into her house in a dazed condition. During the next twelve hours she had thirty-six convulsions, and was delivered of a four months' foetus. No convulsions recurred after delivery, but the patient remained in a dazed condition for three days afterwards. Chloroform was used till after delivery, when chloral and bromides were used per rectum. Diuretics and purgatives were also administered. No morphine was used. The patient lived and gave birth to a child some two years later.

CASE 2. Mrs. B. aged twenty-two, French-Canadian. Family history good. Personal history ordinary. She was a well-nourished woman of splendid physique. Although treated with diuretics and purgatives for several days, eclampsia set in, death occurring in the first attack without delivery having been effected.

CASE 3. Mrs. C. aged twenty-eight, French-Canadian, mother of four children. Eight days after being delivered of a healthy child, the patient had a convulsion following the eating of a heavy meal of meat and potatoes. Diuretics and purgatives were administered with good effect and the patient recovered.

CASE 4. Mrs. J. aged thirty-one, Canadian. Family and personal history not noted. During the fourth month of pregnancy the patient took convulsions during which labour came on. Chloroform was administered and the foetus delivered, after which diuretics and purgatives were employed, which resulted in a slow recovery. This patient was a primipara.

CASE 5. Mrs. R. aged thirty-five, Canadian, primipara. During labour the patient complained of photophobia and shortly after took a convulsion. Chloroform was administered and a healthy child was delivered instrumentally. Recovery followed the use of diuretics and purgatives.

CASE 6. Mrs. M. aged twenty-seven, Canadian. During the second month of pregnancy convulsions occurred. A catheter was used and urine examined, but did not show much albumen. Diuretics and purgatives enabled the patient to go to full term, when she was delivered of a weakly child which died some months later. Recovery was complete.

CASE 7. Mrs. R. aged twenty-six, Canadian. This patient consulted a physician about a month before labour was due. The examination of the urine made at this time revealed nothing abnormal. Labour came on at full term, accompanied by convulsions. The bowels were active. Chloroform was administered and a healthy child delivered with the aid of instruments. Diuretics were applied to the bowel and saline infusions below the breasts. The patient remained in a state of stupor till death took place some eight hours after delivery. Morphine seemed to be contra-indicated and therefore was not used in this instance.

CASE 8. Mrs. M. aged twenty-seven, Canadian. Personal history showed the patient to be liable to periods of amenorrhoea while not pregnant. She was the mother of three children, two of whom were twins. Labour came on at full term, but was accompanied by severe hæmorrhage, leading one to suspect placenta prævia. Digital examination, however, proved this supposition to be erroneous. On his arrival at the case, the writer found the patient blanched, pulseless and in a general state of stupor. Pituitrin and one-twentieth Strychnia with one-fiftieth Digitalin were at once administered hypodermically. After one hour Morphine one-eighth was injected. Patient was delivered instrumentally under Chloroform of a still-born infant, but remained for several hours thereafter in a state of stupor. Recovery followed the use of diuretics and laxatives, followed by iron. Though no definite convulsions were apparent in this case, the writer is of the opinion that it was one of eclampsia.

CURRENT MEDICAL LITERATURE

A DISHONOURED PROFESSION*

It has been thought well to notice briefly from time to time the official evidence, compiled with legal exactness by Government committees, as to the cruelties inflicted on prisoners in German camps. Some of the facts recorded reflected seriously on the competence and humanity of German members of the medical profession. With regret we have to note that during the debate last week in the House of Commons Sir George Cave added a new count to the heavy indictment previously framed. After referring to cruelties perpetrated on prisoners in the camps, in the salt mines, and on those treacherously employed immediately behind the lines to dig trenches and to set up wire, he said: "There are others, even in the hospitals, where, surely, humanity ought to reign. No doubt there are many humane doctors in Germany, but there are others who make a cruel distinction between British prisoners and other prisoners of war; and even among nurses many are found who, far from helping suffering prisoners, have stooped to inflict insult and injury upon them. The hospitals, as is shown by the condition of our men who are arriving in Holland and Switzerland, are in a very bad state, and our wounded do not get proper treatment." The ill-conditioned behaviour of German Red Cross nurses is no new thing, and has often added deliberate cruelty to insult, but there are exceptions. Mrs. Vincent Smith, the daughter of Colonel Baddeley, British Consul at Bruges, in her account of their captivity in Germany, published in the *Times* on November 2nd, states that the serious condition of her father when they arrived at Aix-la-Chapelle so aroused "the pity of the Red Cross ladies that one brought him some soup, when a doctor nearly knocked the cup out of her hand and asked her what she meant by having pity on an Englishman, and ordered our sentries to take us away." This same doctor a little later came on to the station platform "and collected a crowd, cursed us in English, our sentry and the police officer, and said he would have all English shot if he had his way." At Giessen one other German woman showed that she was shocked by the ill treatment of Colonel Baddeley, who was being dragged to the camp, and in the camp there was one doctor who "was a good sort, but we had another, a professor, a perfect brute. He told the Red Cross men they were never to speak to me, or do anything for me or give me medicine." It is an ugly picture of the mental and moral standard of one of the leaders of the German medical profession. It is known that all the prisoners' camps are not equally bad, and Sir George Cave accounted for it on the ground that the commandants are independent of the Government and even of the War Ministry, being responsible only to the Kaiser. Some camps are now, at all events, reasonably well organized, but "there are others," Sir George Cave said, "where the conditions are to me unspeakable; the cruelty, inhumanity, and brutality going on are almost past the belief of any human being." This is done on the Kaiser's responsibility, but punishment ought to be meted out to those members of the medical profession who have disgraced their calling by making themselves the willing instruments of his cruelty, inhumanity, and brutality. Sir George Cave stated, on November 5th, that the names of all army commanders or other persons who are known to have been guilty of, or to have encouraged cruelty to our prisoners of war, or to have acquiesced in acts of cruelty by persons under their authority, will be included in the list of persons whose trial and punishment will be demanded by the Allied Governments.

*British Medical Journal—Nov. 9, 1918.

On the same day he stated that the German Government had at length agreed to ratify the agreement as to the exchange and treatment of prisoners made at the conference at the Hague. It is a relief to know that British prisoners are not to suffer through another winter, but no credit should be given to Germany for its tardy action in its hour of defeat.

A MEMORANDUM ON INFLUENZA*

FROM THE ROYAL COLLEGE OF PHYSICIANS OF LONDON.

The present epidemic is virtually world-wide, irrespective of race, community, or calling. Similar world-wide epidemics occurred in 1803, 1833, 1837, 1847, 1890. The long intermission since the last wide-spread epidemic had already made an early reappearance probable, but the conditions of epidemic prevalence of influenza are too obscure to allow of precise prediction.

This outbreak is essentially identical both in itself and in its complications, including pneumonia, with that of 1890. The disproportionate occurrence of a special symptom, a well-recognised phenomenon in the case of epidemics—as, for example, nose bleeding in the present epidemic—does not invalidate this statement. The present epidemic has no relation to plague, as some have suggested.

Although there can be no question that the virus of influenza is a living organism, and capable of transference from man to man, yet the nature of the virus is still uncertain. It is possibly beyond the present range of microscopic vision. The bacillus discovered by Pfeiffer, commonly known as the influenza bacillus, has in the past been regarded as the probable cause, though on insufficient evidence. There is doubt as to the primary part it plays in the disease, important though it probably is as a secondary infecting agent. Pfeiffer's bacillus, the pneumococcus, and above all in this epidemic the streptococcus, seem to be responsible for most of the fatal complications of influenza.

Infection is conveyed from the sick to the healthy by the secretions of the respiratory surfaces. In coughing, sneezing, and even in loud talking these are transmitted through the air for considerable distances in the form of a fine spray. The channels of reception are normally the nose and throat.

It is manifest that the closer the contact the more readily will this transmission occur; hence the paramount importance of avoiding overcrowding and thronging of every sort, whether in places of public resort, public conveyances, factories, camps, dwelling rooms, or dormitories.

The sum of available evidence favours the belief that the period of incubation is about 48 hours or even somewhat less.

The dangers of influenza are gravely increased by the complications, and much can be done to avoid or to mitigate these. Such complications may develop insidiously, and without previous signs of severe illness.

Carefulness does undoubtedly decrease, and carelessness increase, both morbidity and mortality; it is important, therefore, that the public should have a clear idea of such measures of personal prophylaxis as are available against infection; larger measures of public health,

administered by Government or local authorities, stand outside the scope of the present Memorandum. The individual must be taught to realise and acquiesce in his duty to the community.

Well-ventilated airy rooms promote well-being, and to that extent, at any rate, are inimical to infection; draughts are due to unskilful ventilation and are harmful; chilling of the body surface should be prevented by wearing warm clothing out of doors.

Good nourishing food, and enough of it, is desirable; there is no virtue in more than this. War rations are fully adequate to the maintenance of good health, though they may not afford just the particular articles that each fancy demands. Alcoholic excess invites disaster. Within the limits of moderation each person will be wise to maintain unaltered whatever habit experience has proved to be most agreeable to his own health.

The throat should be gargled every four to six hours, if possible, or at least morning and evening, with a disinfectant gargle, of which one of the most potent is a solution of 20 drops of liquor sodachlorinatæ in a tumbler of warm water. A solution of common table salt, one teaspoonful to the pint of warm water, is suitable for the nasal passage; a little may be poured into the hollowed palm of the hand and snuffed up the nostrils two or three times a day.

Since we are uncertain of the primary cause of influenza no form of inoculation can be guaranteed to protect against the disease itself. From what we know as to the lack of enduring protection after an attack, it might in any case be assumed that no vaccine could protect for more than a short period. But the chief dangers of influenza lie in its complications, and it is probable that much may be done to mitigate the severity of the affection and to diminish its mortality by raising the resistance of the body against the chief secondary infecting agents. No vaccines should be administered except under competent medical advice.

No drug has as yet been proved to have any specific influence as a preventive of influenza.

At the first feeling of illness or rise of temperature the patient should go to bed at once and summon his medical attendant.

The early stages of an attack are the most infective, but infection may persist throughout the illness, and segregation should be maintained at least till the temperature is normal.

Relapses and complications are much less likely to occur if the patient goes to bed at once and remains there till all fever has gone for two or three days; much harm may be done by getting about too early. Chill and over-exertion during convalescence are fruitful of evil consequences.

The virus of influenza is very easily destroyed, and extensive measures of disinfection are not called for. Expectoration should be received when possible in a glazed receptacle in which is a solution of chloride of lime. Discarded handkerchiefs should be immediately placed in disinfectant, or if of paper burnt.

The liability of the immediate attendants to infection, may be materially diminished by avoiding inhalation of the patient's breath, and particularly when he is coughing, sneezing, or talking. A handkerchief should be held before the mouth and the head turned aside during coughing or sneezing. The risk of conveyance of infection by the fingers must be constantly remembered, and the hands should be washed at once after contact with the patient or with mucus from the nose or throat.

Each case must be treated, as occasion demands, under the direction of the medical attendant.

No drug has as yet been proved to have any specific curative effect on influenza, though many are useful in guiding its course and mitigating its symptoms.—*The Lancet*, Nov. 16th, 1918.



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applied warm and thick over the entire thoracic wall, relieves the congestion by increasing the superficial circulation. The cutaneous reflexes are stimulated, causing contraction of the deep-seated blood vessels. The overworked heart is relieved from an excessive blood pressure; pain and dyspnea are lessened, the elimination of toxins is hastened and the temperature declines. The patient is soon in a restful, natural sleep, which often marks the beginning of convalescence.

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SHORT'S INDEX OF PROGNOSIS AND END RESULTS OF TREATMENT *

If one would venture to adequately review Short's Index of Prognosis with a view to criticism it would be necessary to read the work from cover to cover as each section is a monograph unto itself. Rather than a comprehensive treatise of theory, speculation and suggestion, one finds that the author in collaboration with many contributors has endeavored to weigh in the balance the art of treatment, enunciating facts and findings which constitute real merit in a work of this nature. Each topic of consideration is set forth with results and conclusions. The reader is not left to ponder. The information precludes doubts and quandaries, which undoubtedly is the mark of worth in any text.

A perusal of the work justifies the author in his two principles for publication, namely "to set forth results, and particularly the end results, of various methods of treatment, in such a form as will enable the practitioner to obtain a fair, unbiassed, reasoned opinion as to the prospects of securing for his patient permanent relief, and the risks of such treatment. To furnish data by means of which, apart from the question of treatment, one may seek to arrive at an accurate forecast of what will probably happen to the individual patient."

No exception can be taken to the statement of the author when he says, "the volume is unique; nothing of similar character has appeared before or can compare with it. It therefore possesses a value entirely its own, and one which time will not diminish. Should it find sufficient favour with practitioners for further editions to be called for in the decades to come, the present compilation will yet maintain its position as a register of the progress of the healing art up to the time of its appearance—a date memorable in the world's history as that of the Great War."

Alphabetically arranged the contents are easy of access. It would appear that no prognostication confronting the practitioner has been omitted. As a companion volume to Hutchison and Collier's "Index of Treatment" and French's "Differential Diagnosis" a notable contribution has been achieved. The general practitioner will find in this book a

"An Index of Prognosis and End Results of Treatment" by Various Writers, Edited by A. Rendle Short, Ex-Hunterian Professor, Royal College of Surgeons, Second Edition, 1918, revised and enlarged; 770 pages. Price (by subscription) \$10.00 or Cash \$9.00 net, post paid—Toronto, The Macmillan Company of Canada, Ltd.

host of most useful information which will ever remain as an outstanding tribute to the eminent men who have undoubtedly spent many arduous hours of toil in seeking out what all practitioners of medicine unquestionably desire to know—an index upon which to base rational prognosis.

MINOR MALADIES*

As suggested by the title, this monograph has to deal particularly with the common maladies confronting the general practitioner rather than the classical diseases, which due to their prevalence in Hospital, associated with Medical Schools, form the larger part of the clinical and teaching material which is presented to the students of medicine.

In this connection it might be well to quote from the preface. The author says in part, "When I was first qualified, I went into general practice. I soon found that though moderately well equipped in the diagnosis and treatment of disease which I seldom encountered, I was disconcertingly ignorant in those matters about which I was most frequently consulted, Pneumonia I knew, and Rheumatic Fever, and Typhoid; I was so well acquainted with Phthisis that I confidently recognized it in every trivial cough; and so well versed was I in heart-murmurs that I was prepared to discover them and and treat them, with a combination of digitalis and words of serious warning—even when they had no real significance. With knowledge concerning Tabes, Tumors and Trematodes I was full to overflowing; but I soon realized that I knew very little about a common Cold, less about ordinary Indigestion and nothing at all about the rheumatic conditions. My knowledge of the subject of Personal Hygiene consisted in attributing to flannel all kinds of virtues, and to fresh air all manner of vices. In this dilemma I searched for a book which would lighten my darkness; but I found it not. I then determined that if time and circumstance should ever give me the opportunity of writing such a book, those of my juniors who found themselves in the same predicament should not want for such help as I might be able to afford them. The opportunity came about twelve years later, when I forsook the drive of a busy general practice for the comparative calm of consulting work."

One has only to read *Minor Maladies* to realize that the author has undoubtedly achieved success in consummating his desires for a book of this nature.

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Many texts are to be found which describe in detail the causes, symptoms, diagnosis, etc., of the so-called Diseases, but how often one has sought in vain for direct information upon those little perplexities which are constantly confronting one in the daily round of practice and upon which frequently rests one's success or failure in establishing oneself in the community.

Dr. William's presentation may be aptly called a heart-to-heart talk with the profession upon subjects of general medical interest. The subject matter has been well chosen. Diagnosis by clear reasoning and facile style is succinctly outlined. Treatment of all the common maladies is most thoroughly detailed. The work leaves nothing to be desired and is deserving of a large distribution for its excellence and usefulness.

THE RELIEF OF SCIATIC PAINS AND LUMBAGO

Despite the dicta of certain philosophical physicians that pain should be endured, and indeed is, after all, but a beneficent reaction of the nervous system against threatening forces, relief from pain will be sought by all. In fact, it is obvious that long continued pain exhausts, while excruciating pain, as that of sciatica, urgently calls for relief from the standpoint of rational therapeutic practice. To draw attention to one feature of pain alone which demands, at least, its temporary subjection, reference may be made to insomnia. It is patent that sleep is impossible so long as acute pain is present and it is also clearly apparent, that sleeplessness, lasting over a long period, will sap the strength of the strongest constitution. The strong prejudice that exists against overcoming pain, is mainly because the result is often, perhaps usually, obtained by the employment of narcotics, which although affording the longed for effect, not only upset the digestion but what is worse by far may and frequently do establish the drug habit. Phenalgin is a remedy for pain which acts with a sure and uniform efficiency, and at the same time does not lock up the secretions, upset the digestive functions, nor bring about a drug habit. In other words. Phenalgin relieves pain without exerting any injurious action on the human mechanism and permits and encourages the physiologic forces of the body to work at normal speed. The use of Phenalgin, therefore, is of the greatest service in the treatment of pain from all sources for the reason that it does not interfere with the vital forces of the body but if depressed from one cause or another gives them an opportunity to recuperate and regain their normal tone.

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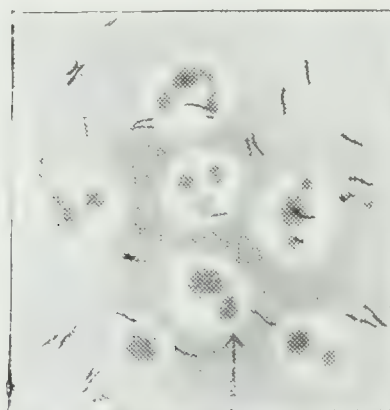
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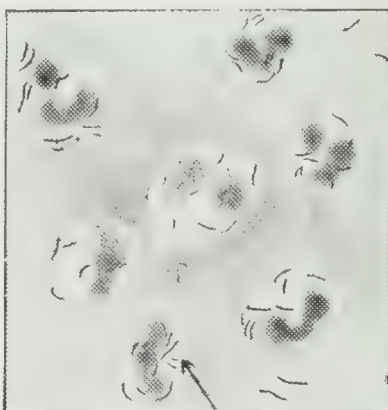
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The results were as follows:

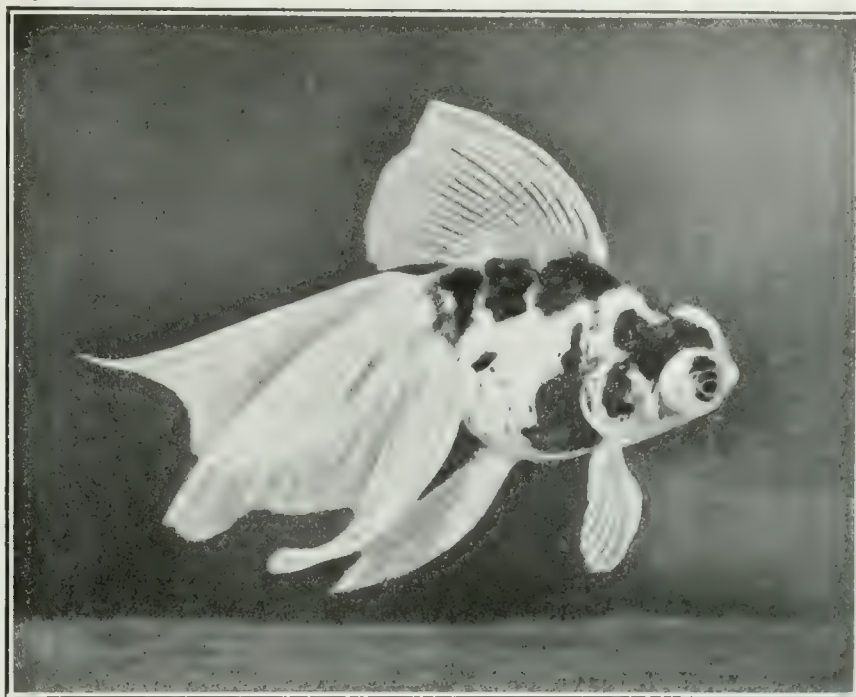
Duration of treatment with VIROL	Average number of Tubercle Bacilli absorbed in 15 minutes, by each Leucocyte	Opsonic Index against B. Tuberculosis
0 weeks	1.1	0.41
2 "	1.3	0.45
6 "	1.6	0.50
9 "	3.8	1.5
12 "	4.5	1.5
Standard	3.0	1.0

From the above table it will be seen that the administration of Bone-Marrow in the form of Virol is attended by a distinct and progressive increase in the phagocytic power of the Leucocytes when tested against the Tubercle Bacillus, due to corresponding increase of opsonins in the sera examined.

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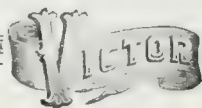
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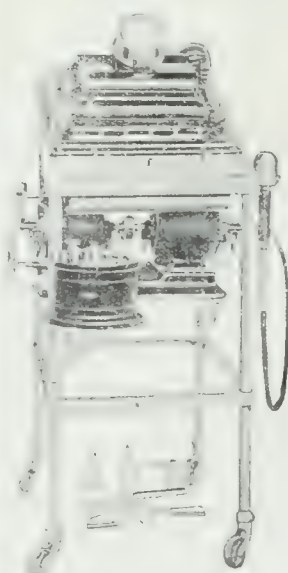
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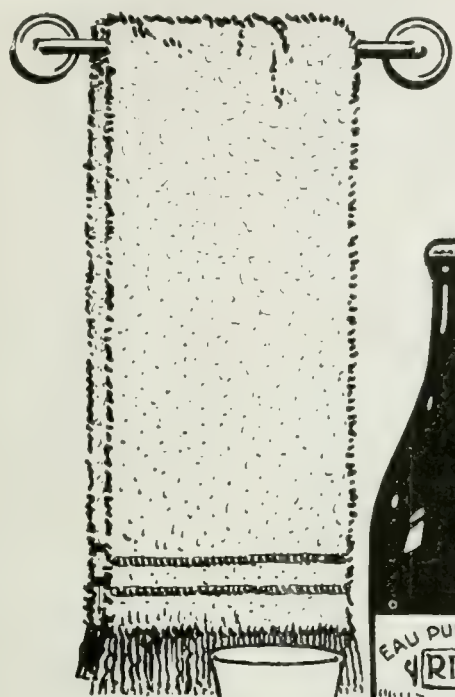
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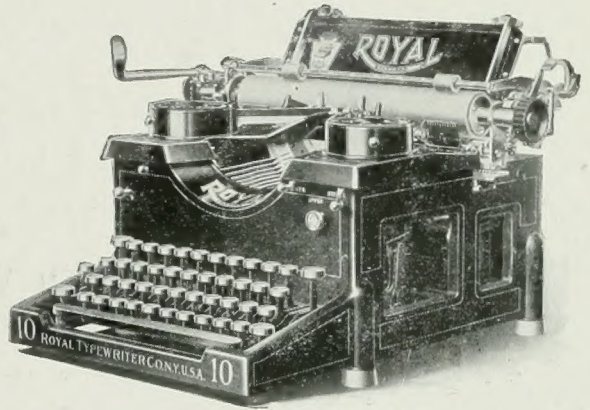
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